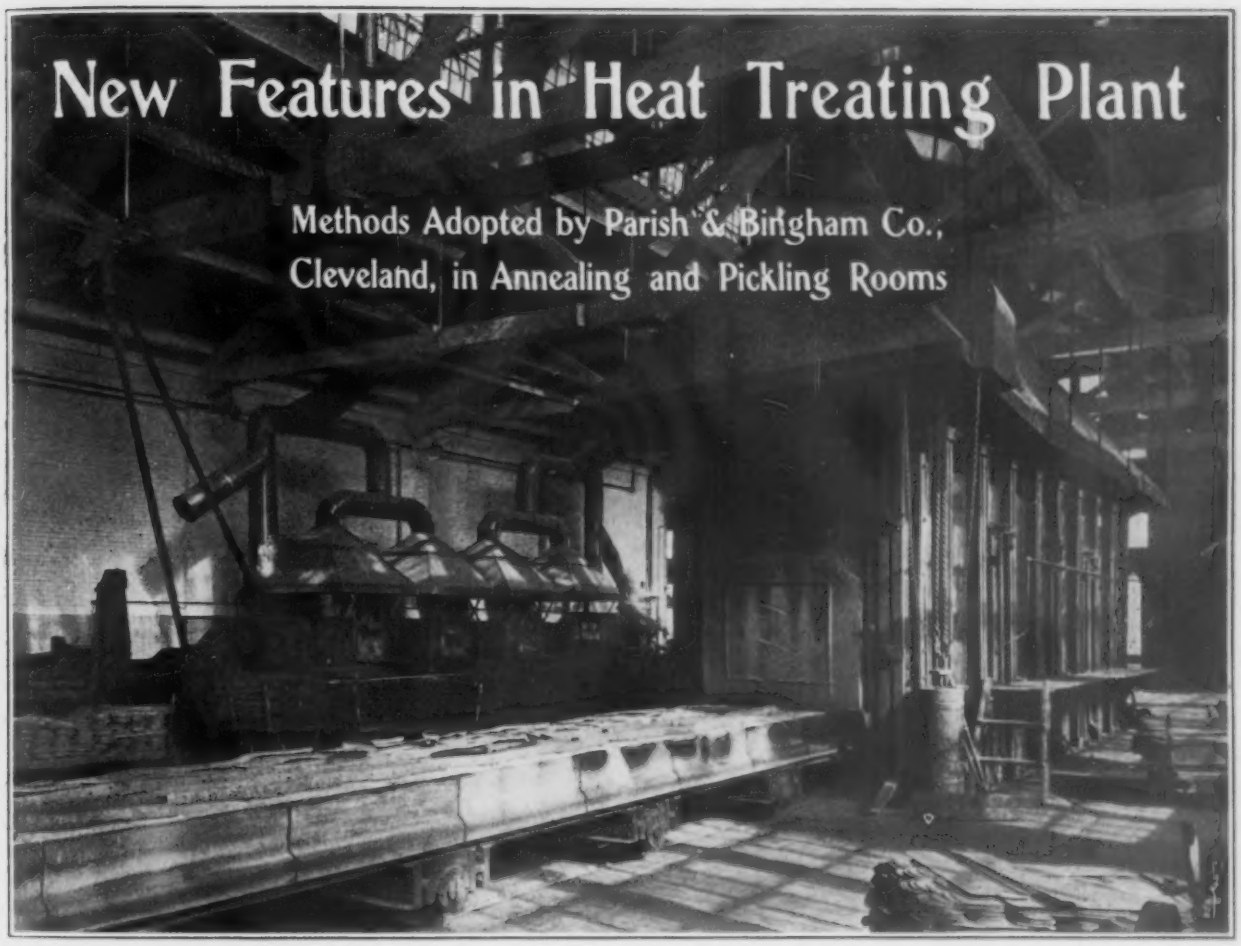
THE IRON AGE

New York, June 5, 1919

ESTABLISHED 1855 VOL. 103: No. 23

New Features in Heat Treating Plant

Methods Adopted by Parish & Bingham Co., Cleveland, in Annealing and Pickling Rooms



Car Type Furnace with Chamber 30 x 6 ft. for Annealing Large Parts of Automobile Frames in Heat Treating Plant of the Parish & Bingham Co., Cleveland. All furnaces are provided with hoods with outlets above the roof for carrying out the smoke and fumes. Small heat treating furnaces with hoods and exhaust pipes are shown at the left.

A HEAT treating and pickling department which has a number of features that represent a departure from the usual arrangement in plants of this character has been built by the Parish & Bingham Co., Cleveland. The question of ventilation in particular was given a great deal of attention in the layout, and the arrangement for assuring the free circulation of air through the heat treating department, including the use of exhaust hoods above the furnaces and the method of carrying steam and fumes from the pickling department, are among features that have caused the plant to attract considerable interest. The heat treating department is used in connection with the company's sheet metal stamping plant, the bulk of the output of which is automobile frames.

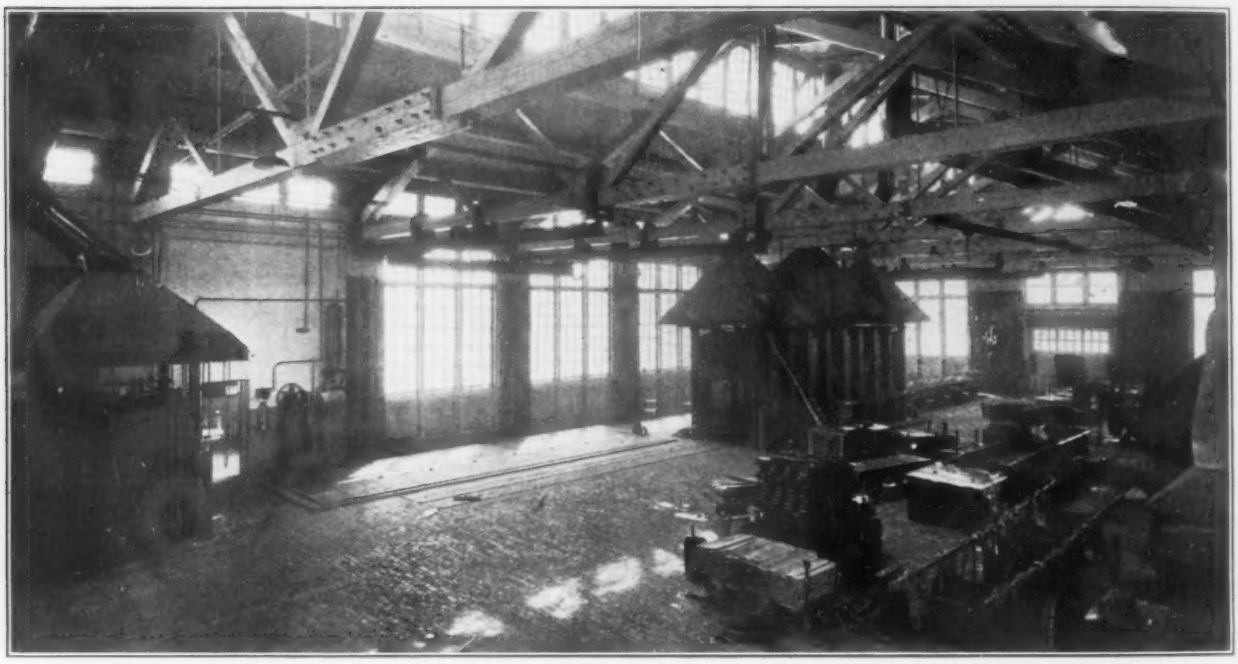
The plant occupies a brick building 80 ft. wide and 144 ft. long, divided by a brick wall into two equal-sized sections, but leaving a wide alcove in the partition wall near one end for conveying material between the two departments. There is a monitor roof over each section. One side is occupied by the heat treating and the other by the pickling department. As few automobile manufacturers specify heat treated frames, the heat treating department is used largely for annealing work, although the furnaces are used for heat treating when required. Because of the effect of the acid fumes on steel, wood beams are used in the roof construction. The floors and side walls are brick.

The furnace equipment includes two large overfired furnaces. One of these is of the car type, has a chamber 30 in. long, 6 ft. wide and 6 ft. high, and is used for annealing the larger parts of automobile frames, including side rails, cross members and sheets. Two cars hooked together are used in connection with this furnace, these cars being the same length as the furnace chamber. They are hauled in and out of the furnace by a winch and cable arrangement, and while one car of material is in the furnace, the other is on the outside being loaded or unloaded. A sand seal prevents the heat from passing below the car platform. This furnace was built by the American Shop Equipment Co.

There is another smaller furnace of the same

type having a chamber 10 ft. long and 5 ft. wide, and a built-in bottom, that is used for annealing and heat treating smaller parts. This furnace also has doors at each end. In addition to the large furnaces there are on the opposite side of the room four small furnaces of the Frankfort type, a cyanide pot furnace, a brazing furnace and two lead annealing furnaces. The furnaces are equipped with Brown recording pyrometers.

All the furnaces are equipped with hoods for carrying the fumes of the smoke outside of the building, these hoods being connected to large pipes providing outlets above the roof. Oil on the parts that are treated causes considerable smoke when these are being heated, and this is all exhausted through the hoods, leaving the room free of smoke at all times. In order to assure a free circulation of air through the heat treating department and out the windows in the monitor and up through the furnace hoods, doors about 3 ft. high reaching down to the floor are provided under each side and rear wall window. Enough of these are kept open to permit a good circulation, and the windows in the walls are kept closed.



Under Each Window in the Side and Rear Walls Are Swinging Doors in Order to Provide a Free Circulation of Air from the Floor Up Through the Room and Out Through the Windows in the Monitor and Exhaust Pipes Connected to the Hoods. The quenching tanks are in the floor alongside the car track in front of the furnace.

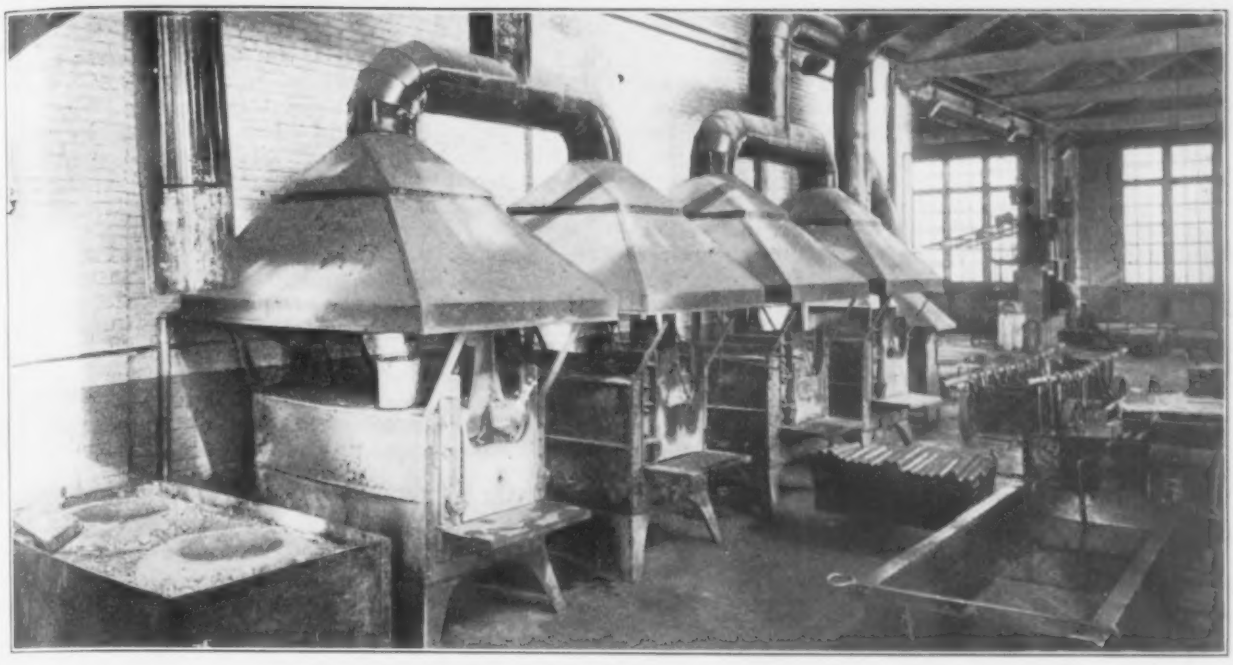
An interesting feature of the plant is the arrangement of the quenching tanks for the two larger furnaces. Instead of having these tanks extending above the floor, as is customary, the tanks are flush with the floor. These tanks, one for oil and one for water, are 30 ft. long, 5 ft. wide and 6 ft. deep, and are located at the front of the large furnace at the side of the car track, but serve both furnaces. Two objects were obtained by having the tops of the quenching tanks on a level with the floor. One is the providing of more floor space. The tanks have sectional wood tops and are covered over when not in use so that they are entirely out of the way and that additional floor space is available. The other advantage of the depressed tanks is convenience in handling material. Instead of using a hoist for conveying the parts to the tanks, as would be necessary with the ordinary arrangement, the car load of material is run out on the track in front of the furnace, and the load is slid off into the tanks. The tanks are served by a 2½-ton Euclid hoist, which is used for removing the material after quenching. In front of the small furnaces are quenching tanks raised above the floor.

Another interesting feature of the plant is that the furnaces have double connections for fuel or air so that should it be necessary to change from oil to gas or from one source of air supply to another, the change can be made without causing delay in operations. It is stated that with the double fuel connections the change can be made from one fuel to the other in 5 min. Blast for the furnaces is supplied by a General Electric centrifugal blower located in the heat treating department, but connections are made with the air compressor system in the adjoining main plant so that should the blower get out of commission blast will be supplied from the compressors.

Fuel oil is stored outside in two 20,000 gal. tanks from which it is delivered to the furnaces by circulating pumps. The oil in the large depressed quenching tank is kept cool by being circulated through coils inside the adjoining cold water quenching tank. All piping, including oil, gas, air, water and steam lines, is carried in concrete conduits 14 in. wide and 18 in. deep just beneath the floor, and covered over with movable plates, thus eliminating piping in the building and making all piping accessible. The room is served by two 2½-ton and one 5-ton Euclid monorail hoist, the track for the larger hoist extending around through the alcove into the pickling department.

In the pickling room there are 10 tanks, seven for acid, two for hot water and one for lime. These are 31 ft. long, 4 ft. wide and 6 ft. deep. The tanks are on tile foundations with gutters between them, these discharging into one large clean-out. Outside storage capacity is provided for two tank cars of acid. The acid is piped from tanks into the building instead of being carried in buckets as is usually done.

The pickling department is served by a 10-ton remote control hoist specially designed by the Euclid Crane & Hoist Co. to meet the conditions in this plant. On account of the excessive acid



Battery of Frankfort Furnaces Used for Heat Treating Small Parts

fumes, all of the electrical equipment is mounted outside of the pickling room and only the trolley and cables which operate it are exposed to these fumes. An I beam extends over the center of the tanks and forms the track for the monorail which carries the trays containing the parts to be dipped in the solution. The hoist has a lifting speed of 10 ft. per min. and a traveling speed of about 125 ft. per min. Automatic safety devices are provided to limit the upward movement of the hook block and also the travel movement of the trolley at each end so that no damage will ensue on account of possible carelessness on the part of the operator. These safety limit devices operate circuit breakers within easy reach of the operator.

Control of all the hoists is from a central station located on a raised platform in the alcove between the heat treating and pickling departments where the operator has a clear view of both rooms.

The arrangement for exhausting the steam and acid fumes from the pickling department is of interest. A 36-in. exhaust pipe is located in a horizontal position above the roof, being placed outside the building where it is easily accessible from the roof, which would not be the case were it located inside the building under the roof. Connected to the main exhaust pipe are 10 feeders with 36-in. outlets in the monitor roof. There would ordinarily be a condensation of steam in the exhaust pipes, but this is prevented by exhausting the heat from over some of the furnaces into these pipes. With this arrangement the steam is carried without condensation through the exhaust pipes to the condensing chamber between an American Blower Co. exhaust fan located under the roof, and the main exhaust pipe. From the condensing chamber the steam is drawn away. This plan prevents the moisture from staying in the exhaust pipe and tends to preserve the fan.

View of the Pickling Department. Gutters are provided between the pickling tanks, and these discharge into one clean-out. Steam and acid fumes are carried through outlets in the roof to an exhaust pipe located for convenience in a horizontal position above the roof and connected to a suction fan

Gantry Portal Crane for Yard Work

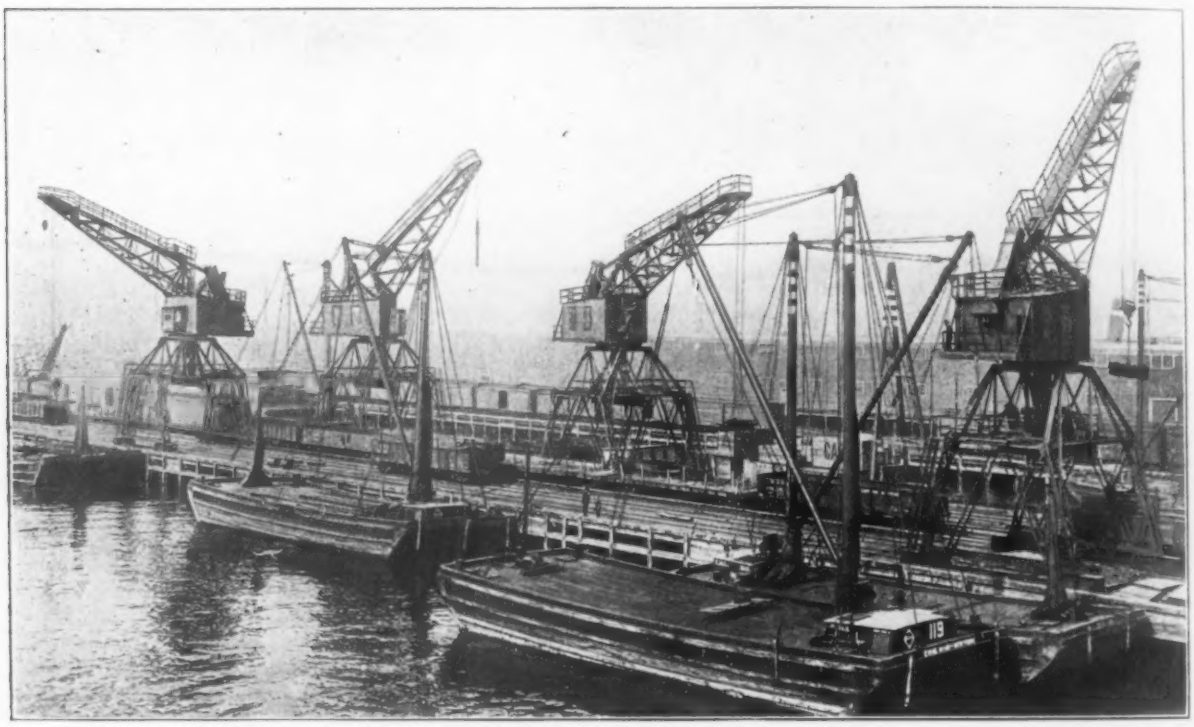
An electric traveling portal gantry crane, in which a heavy forged steel worm screw is used for raising or lowering the jib, has been developed by Heyl & Patterson, Inc., Pittsburgh. The jib is hinged, and the screw runs in bronze nuts connected to the top chord of the jib through steel links. Three of these, two 10-ton and one 20-ton units of this design, have been installed at the Weehawken terminal of the Erie Railroad in New York harbor for loading direct from cars on pier to steamer hold. This pier, 1000 ft. long and 80 ft. wide, is provided with five railroad tracks, extending the full length and having a combined capacity of 200 cars, making for conjested traffic conditions, a factor which was the prime consideration in the development of this type of crane.

The hook lift of the crane is 90 ft., ranging from 30 ft. below the level of the crane rails to 60 ft. above.

The cranes are mounted on equalizing structural steel trucks, one 2-wheel truck being provided under each of the four corners of the portal. The truck connection to the portal structure is flexible, thus equalizing the load on both wheels at each corner.

A 25-hp. fully inclosed motor located on the portal and connected through cut steel gears to one wheel at each portal gives an equal tractive effort for traversing the machine irrespective of the direction of the wind. The motor is equipped with a drum type controller located in the cab. Whenever the power circuit is opened, by accident or by the operator, a magnetic brake is provided on the armature shaft of the motor automatically to stop the traveler.

The hoist motor consists of an 81-hp. open mill type motor, connected through cut steel gearing to a cast-iron drum hoist. A magnetic brake on the armature shaft of the motor acts automatically to hold the load at such times as the power circuit is open. In addition a combined brake and friction clutch is provided in the drive to disconnect the hoisting drum and hold it stationary while raising or lowering the jib. The combined brake and clutch is so constructed that the brake will be normally set and the clutch released. The clutch is set and the brake released by means of a solenoid.



Gantry Portal Cranes on Erie Railroad Dock, Driven from Protected Third Rail, Replaced Locomotive Cranes, Increasing Trackage for Freight on Pier 67 Per Cent and Speeded up Direct Loading Between Cars and Ship's Hold

They have a working radius of 48 ft. 6 in., permitting loading or unloading of cars on any of the five tracks and giving a reach of 30 ft. 6 in. beyond the pier edge. The cranes straddle the two tracks at one side of the pier and have a vertical clearance from top of gantry rails to lowest position of boom of 55 ft.

For loads up to 5 tons the 10-ton crane has a hoisting speed of 220 ft. per min., for loads of 5 to 10 tons, 110 ft. per min., these two speeds being obtained by means of hand-operated gear shift. The rotating speed is 3 r.p.m., and the traversing speed 150 ft. per min.

The 20-ton crane has a capacity of the main hoist of 20 tons and of the auxiliary hoist 5 tons; and handles 5 tons or less at 220 ft. per min. and from 5-ton to 20-ton loads at 55 ft. per min. Its rotating speed is 2 r.p.m., and its traversing speed 100 ft. per min.

These cranes travel on independent tracks, leaving the five tracks entirely clear for freight traffic, and replace standard locomotive types for which it was formerly necessary to employ two of the tracks for switching purposes. The time required to load from the pier to the ship by this method is said to be more than 50 per cent less than that required normally to load from barge to ship.

Each crane is equipped with three electric motors, one each for traversing the crane; rotating the jib; raising and lowering the load and raising and lowering the jib. These motors are all 230-volt series-wound direct-current machines and each one is protected by overload relays mounted on a panel in the crane cab.

The controller for the hoisting engine is of the magnetic contractor type and gives either power or dynamic braking, as may be required for lowering the empty hook without any shift of the controller handle. Limit switches automatically prevent an overhoist of the load. Limit switches limit the travel of the boom in each direction.

The rotary movement is effected by a 33-hp. crane-type motor geared to a heavy steel gearing bolted to the top of the portal. The motor is equipped with a drum-type controller located in the cab, and a magnetic brake on the armature shaft of the motor automatically stops rotation whenever the power circuit is opened.

The control equipment consists of drum controllers for the travel, and rotating motors and a master controller for the hoist motor. This latter is equipped with an auxiliary interlock providing for operating the hoist engine, for raising the hook, and for lowering the boom.

Electric power for the crane motors is brought to a sub-station near the shore end of the pier on a two-phase four-wire 2300-volt circuit. This is transformed to six-phase 188-volt alternating current.

The British Electric Steel Industry

Its Present Status, Output and Operation — Causes of Trouble — Electrode Consumption — Total Furnaces 117

AN important paper dealing with the status, operation and output of the various types of electric furnaces in the British steel industry was presented by R. G. Mercer at the May meeting of the Iron and Steel Institute in London, May 8 and 9. The main object of the author is stated to have been the giving of any information possible which may tend to increase the general efficiency of electric steel furnaces in that country. An abstract of the paper follows:

There are installed or being installed 141 electric furnaces with a total capacity of 112,000 kva. Of these, 24 are being or will be used for Swedish substitute, cupro-nickel, alundum, manganese copper and ferroalloys. The remaining 117 are electric steel furnaces having a total charging and kva. capacity of 384 tons and 98,769 kva. respectively, and a total nominal output of 31,170 tons per month, based on five days a week, four weeks per month. Assuming that all these furnaces are working at full load, the total nominal output at the end of a year would be 405,000 tons. It has to be borne in mind, however, that some furnaces only work on day shift, others are shut down or not yet installed and all those in commission have delays due to furnace and electrical troubles and shop conditions. Particulars of these furnaces are given in Table 1. The nominal output in tons per month is based on five days a week, four weeks a month, and the rated charging capacity of the furnace.

Table 1—Electric Steel Furnaces in the United Kingdom

Type	Number	Total tons, size	Total k.v.a.	Nominal tons output per month
Electro-metals	27	73	20,274	6,740
Greaves-Etchells	26	64½	18,830	5,680
Héroult	45	180½	43,220	13,760
Rennerfelt	4	7	1,895	750
Snyder	6	9½	3,150	1,200
*Special	2	2	750	280
Stassano	2	2	600	240
Stobie	5	45½	10,050	2,600
Total	117	384	98,769	31,250

*Made by the user.

Table 2 gives the particulars of furnaces installed for castings and the practical results over a period of time are given in Table 3.

On visiting the various steelworks the author found that while some users kept proper records of the operation and the output of their furnaces, others confined themselves to the output and kept no proper records of current or electrode consumption or causes of delay. Efforts were therefore made to secure returns to the Ministry of Munitions which should be complete. From the returns so made the author was able to compile a series of tables giving the records of performance in considerable detail and embodied these tables in his paper.

After a careful comparison of the various sizes and types of furnaces, the author has arrived at the following particulars, setting forth the size, kva. capacity and nominal output of each.

The nominal output per month is based on the assumption that the weight of charge is equal to the rated charging capacity of the furnace. In actual practice, however, this is not the case in many furnaces; the 6-ton furnaces, for instance, take from 6.8 to 10.2 tons per charge on the average. Consequently the actual output is increased, though on the other hand the heat period would increase and the average number of heats per day might be less than the above estimate.

The chief causes of delay in the operation of the country's electric furnaces during the period covered by the author's review were the following:

Failure of Electric Power Supply.—Failure due to breakdown of generating plant and lack of spare plant occurred in one or two cases. The generating stations were working at their maximum capacity and were at times severely overloaded and there were few opportunities for overhauling the boilers and other plant. The result was that when shortness of supply happened, the first plant to be shut down, with little or no notice, was the electric furnace.

Breakdown of Furnaces.—Delays due to this cause have been far too frequent. In the author's opinion the tilting gear and general arrangement of electrode feed gear on certain types have not been designed to withstand the conditions in a steelworks. He has many records of stripping on the tilting gear, resulting in very narrow escapes in some instances. He also has records of stripping of the electrode raising and lowering gear, with the result that the gallows arm falls right down, with consequent damage to the furnace and very possibly transformer troubles.

Water-Cooled Collars.—These at the electrode entrance in the roof have been a source of constant troubles and delays. Their breakdowns are undoubtedly due chiefly to failure of water supply but many installations are now complete with a tank placed above in a suitable position, the tank being kept filled from the water mains or other source, so that in the event of the main supply being shut off for any reason, there is a sufficiency to carry on with.

Electrode Holders.—Electrode holders of certain types also gives a lot of trouble. Personally, the author has little or no use for a water-cooled electrode holder for in his opinion its use is an admission that it is exposed to the hot gases coming through the roof at the electrode entrance, which therefore has no suitable economizer or seal, or that it has not a proper electrical contact around the electrode. If electrodes (and especially amorphous carbon) are operated at a proper current density, and assuming they are not of inferior quality, the holder should be able to carry the necessary current without undue heating.

Electrode Consumption

Of the gallows-arm type of furnace the Snyder can claim over a period an electrode consumption as low as 7 lb. of 4-in. graphite per ton of steel in ladle. The Héroult, Greaves-Etchells, and Electro-Metals have, with economizers, each shown a graphite consumption, over a period, of 13 lb. per ton, which is good but will, the author hopes, be improved still further. Of the furnaces having no gallows arm the Stobie shows an electrode consumption of 9-in. graphite as low as 6.5 lb. per ton over a period of 5½ months.

Table 2—Furnaces Producing Castings

Type	Number of furnaces	Tons, size	Total k.v.a.	Tons output per month: Nominal	Tons output per month: Actual
Electro-metals	13	25½	8,139	2,900	....
Greaves-Etchells	4	7	2,050	700	....
Héroult	7	16	4,150	1,560	....
Rennerfelt	2	5½	1,100	440	....
Snyder	6	9½	3,150	1,200	....
Special	2	2	750	280	....
Stassano	2	2	600	240	....
Stobie	1	5	800	400	....
Total	37	72½	20,739	7,720	5,019

Low-Tension Conductors.—These have not in all cases received the necessary attention in the past. The author's opinion is that a current density of 750 amperes per sq. in. is ample for copper strip, for they are nearly sure to be run at a higher rate in actual practice.

Transformers.—These are, after all, the most im-

portant part of the furnace installation, for a breakdown of one (unless there is a spare at hand) involves in nearly all cases a considerable delay of anything up

Table 3—Practical Results

	Nominal capacity	Actual output	
Castings	7,720	3,557	46 per cent
Ingots	16,580	9,855	59 per cent

to two months. Until recently two transformer makers have had the bulk of the furnace business. Breakdowns of both makes have occurred. In the early days these were no doubt due to the fact that the makers did not appreciate, as they did very soon after, the very heavy service their apparatus would be called upon to stand up to. They did not know what heavy surges the transformers would be liable to during the melting-down period; on the other hand, they were in some cases of insufficient capacity. The transformers were then greatly improved both mechanically and electrically and by degrees transformers of a bigger k.v.a. capacity were installed but, notwithstanding all this, breakdowns though less frequent happened owing to causes quite outside the transformer maker's control. Automatic voltage and current regulators are going to help not only the transformers but also the power supplier. The regulators can be put into commission direct on to a cold charge without any hand control. The electrodes can be rapidly withdrawn on the occasion of very heavy overloads. The result is a very good load chart. The Woolwich Arsenal has a set running in conjunction with one of two 6-ton 2000-k.v.a. Greaves-Etchells furnaces.

America's Lead

The author has confined this paper to electrical steel furnaces and does not deal with the 24-arc furnaces referred to above. Neither does he deal with furnaces of the resistance type such as those used for carbide and laboratory purposes, or the small furnaces now coming into use in this country for heat-treatment purposes. Comparing the total of 117 electric steel furnaces with those installed in the United States and Canada, the author notes from THE IRON AGE that America in January, 1919, is credited with 287, which includes three induction furnaces (there are none in operation here so far as the author knows) and Canada is credited with 43 furnaces.

Table 4—Ratings of Electric Furnaces

Ingots or Castings	Size, tons	K.v.a.	Average hr. per heat	Number of heats per day	Nominal tons per month of 20 days
Ingots	½	250	2.75	7	70
Castings	½	250	2.25	8	80
Ingots	1½	500	3.25	6	180
Castings	1½	500	3	7	200
Ingots	2–2½	650	4.25	5	220
Castings	2–2½	650	3.5	5	240
Ingots	3–3½	850	5.75	4	280
Castings	3–3½	850	4.75	4	280
Castings	5	1,000	4	5	500
Ingots	6	1,500	7.5	3	360
Ingots	7	1,800	7.5	3	420
Ingots	10	2,500	7.5	3	600
Ingots	15	3,000	7.5	3	900

FOUNDRY CONVENTION PLANS

Technical Papers Already Arranged for—Social Aspects of Meeting to Be Emphasized

The American Foundrymen's Association is completing plans for the twenty-fourth annual meeting, which will be held in Philadelphia Sept. 30 to Oct. 3 inclusive. Special stress will be laid on both entertainment and technical features of the program, the local committee having charge of the social features, and over 25 technical papers and addresses have been arranged for. The opening session will probably be on Tuesday, Sept. 30, and simultaneous sessions are planned for the following two days, with special sessions as usual for discussing gray-iron, steel and malleable foundry practice.

The exhibition of foundry and shop equipment will be held in the Commercial Museum, and the indications are that a record exhibit will be held.

The Philadelphia local committee was formed at a recent meeting of the Philadelphia Foundrymen's Association. Thomas Devlin, Thomas Devlin Mfg. Co., president Philadelphia Association, and Howard Evans, J. W. Paxson Co., secretary, are ex-officio members. The other members are: G. H. Clamer, Ajax Metal Co., Philadelphia; C. R. Spare, American Manganese Bronze Co., Holmesburg, Pa.; H. W. Brown, Tabor Mfg. Co., Philadelphia; Frank Krug, White & Brothers, Inc., Philadelphia, and J. D. Hibbs, J. W. Paxson Co., Philadelphia. It is expected this committee will be enlarged and its work organized through sub-committees.

It is expected that the entertainment program which is being prepared will emphasize the prominence of the Quaker City as a foundry center. The details are still to be worked out, but it now seems assured that one of the features of the program will be a shad dinner of the variety for which Philadelphia is famous. Other unique entertainment features are contemplated.

Among the technical papers already arranged are: "Results of an Investigation of Steel Castings on German Submarines," by Prof. William Campbell, Columbia University, New York; "Training Men for Foundry Work," by C. C. Schoen, training section, Department of Labor; "The Comparative Qualities of Electric and Converter Steel Castings," by John Howe Hall, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.; "Experiments with Melting High Sulphur Malleable Scrap," by A. W. Merrick, General Electric Co., Schenectady, N. Y.; "The Side Blow Steel Converter and Its Possibilities for the Gray-Iron Foundry," by George P. Fisher, Whiting Foundry Equipment Co., Harvey, Ill.; "Mocromotion Study for Foundrymen," illustrated by moving pictures, by Major Frank B. Gilbreth, Providence, R. I.; "Electric Furnaces for Foundry Use, Specially for Annealing Steel Castings," illustrated by motion pictures, by T. F. Baily, Electric Furnace Co., Alliance, Ohio; "Methods for Determining When Malleable Iron Is Over Or Under-Annealed," by Major W. P. Putnam, Detroit Testing Laboratory, Detroit; "Relation Between Machining Qualities of Malleable Castings and Physical Tests," by Edwin K. Smith, Wisconsin Malleable Iron Co., Milwaukee; "How to Secure Best Results in Combining Hoisting Apparatus With Molding Machines," by W. C. Briggs, Shepard Electric Crane & Hoist Co., New York; "Concrete Foundry Floors," by H. H. Haley, American Foundry Equipment Co., New York; "Personnel Problems of Modern Industry," by C. D. Dyer, Jr., consulting engineer, Philadelphia, and "Foundry Sand-Handling Equipment," by H. L. McKinnon, the C. O. Bartlett & Snow Co., Cleveland.

News of the German Steel Industry

More than half of the Upper Silesian blast furnaces in Germany have been closed down and many more are expected to cease operations shortly, owing to the lack of ore; the pig-iron output is decreasing to an extent unprecedented in recent years.

The Rombach Iron works in Lorraine have been under compulsory French administration since the armistice, and were shut down during the time the inventory was taken. Work has now been resumed, and five of the seven furnaces are in full blast. The steel and rolling mills are working part time, but will shortly resume operations to the full extent.

The German Steelworkers' Union has notified the five German Joist Merchants' Association of the dissolution on June 30 of this year of the existing contract between them and the union. No reason for this measure is given, but it is connected with the radical changes which are taking place in the syndication of the German iron industry.

Production of Albany Molding Sand

An Analysis of Their Origin and Composition—Standard Specifications Based on Grain Size Difficult

BY ROBERT W. JONES*

THE literature, concerning both the geology and commercial production of the Albany molding sands, is not very abundant. Short articles have appeared from time to time in the various reports of the New York State Geologist and in certain technical and trade journals, but in no case has any attempt been made towards a study of the various conditions of deposition and mineralogical and chemical composition.

The commercial classification of the Albany sands has usually been expressed by designating them under either a number or letter in the ascending order of grain diameter or quantity of bond. At present the classification is usually a division of six grades known to the trade as 00,0,1,2,3,4 and less frequently as A,B,C,D,E,F. Intermediate grades are sometimes placed on the market such as 1½,2½,3½.

Attempts have been made to formulate strict specifications as to grade, but owing to the many varying factors this has not been a success. Some have approached the subject by specifying grain size, others by the amount of voids and some have attempted a specification as expressed through a chemical analysis by designating the percentage of silica, alumina and calcium. One factor in relation to specifications and as expressed in the chemical analysis and to which very little attention has been paid is the percentage of combined water. In the average custom analysis it is very rare that a careful and correct determination is ever made, under standardized conditions, for combined water.

A short discussion concerning the conditions of deposition and subsequent chemical and physical changes will perhaps throw some light on the subject of molding sand specifications and the inability to sometimes secure consecutive shipments, from some regions, which will stand up under standard conditions of work.

Geology of the Deposits

The sands are of fresh or slightly brakish water lake deposition. During a comparatively recent geological period the present Hudson valley was occupied by a glacier having its southern limit approximately in the latitude of Long Island. On the advance of this ice sheet, from the north, large quantities of glacial material were deposited in the form of lateral, terminal and ground moraines. During the retreat of the ice, marginal, terminal and under-ice deposits of different character were formed. In some localities, especially along the east and west boundaries of the melting ice, local deposits of sand and clay were formed. As the ice continued to retreat northward a continually increasing body of comparatively quiet water was formed along its southern front. This body of water eventually extended, from the present Atlantic ocean, on the south, through the Hudson and Champlain valleys, to salt water in the St. Lawrence valley and has been designated geologically as the Hudson-Champlain strait.

Expansions of this strait, at two localities, are known as Lake Albany and Lake Vermont. The deposits of Lake Albany occupy approximately the area under discussion. For a considerable time the Lake Albany deposits were of a regular and quiet deposition and consisted almost entirely of finely divided quartz bonded by calcium and magnesium salts and carrying a varying percentage of alumina in a form which can hardly be expressed as kaolinite. These deposits were built up to what, in the Albany section, is approximately the present 200-ft. contour.

At this period a very sudden change occurred with a sudden inflow of waters from the north and north-west bringing a deposit of comparatively coarse grain quartz, depositing this along the shores of Lake Albany as a delta deposit. As the shallow water currents swung backward and forward local deposits of clay were formed in some places having a thickness of from 18 to 20 ft. This clay deposit, which was of quite general occurrence, although in some localities only a few inches thick, divides the sand deposits into two beds. Upon a superficial examination the sands of the two beds appear to be identical in composition. Fig. 1 shows in a general way the typical section through the delta deposits and lower clays. All of these deposits have geen affected by the inflow of eastward and westward flowing streams and this section is to be considered as an ideal section.

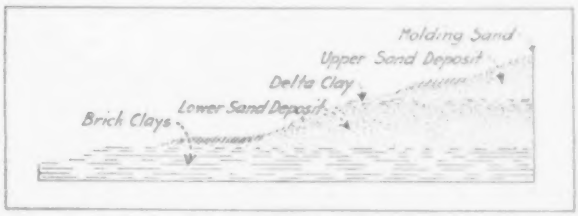


Fig. 1—Typical Section Through the Delta Deposits and Lower Clays

The molding sands are the result of a secondary chemical action on the original minerals composing the two sands. The molding sand layers which in only a very few cases are over three feet thick are usually divided into two beds rather sharply defined and known as the surface or molding sand proper and the under sand in which the percentage and character of bond is somewhat different. The under sand as usually found has a slightly finer grain than the surface sand and has a slightly bronze or greenish tinge as compared with the dark brown, yellow or almost white color of the molding sand proper. The molding sand deposit follows the contour of the surface although mainly occupying the benches or flats.

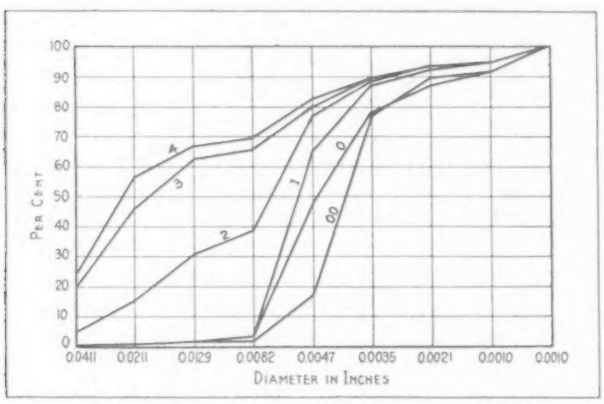
Methods of Production

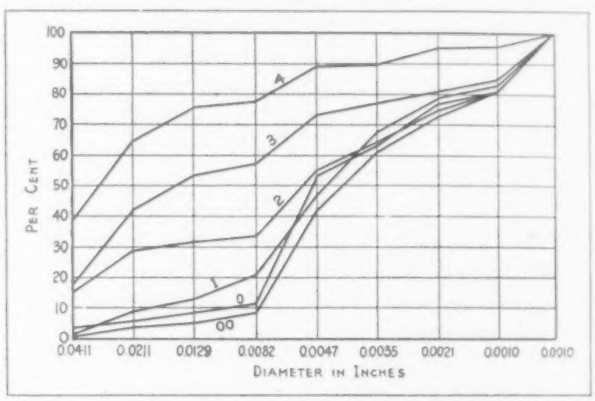
Commercially the molding sand production may be divided into three grades or products: The natural sands; the mixed sands; the prepared sands. The natural sands are those taken

*Consulting engineer in mining, metallurgy and geology, Tompkinsville, N. Y.

as they are found without any field treatment. The mixed sands are usually a mixture of the surface and under sands made in the field. The prepared sands are taken from the lower bed below the clay. With these sands no attempt is made towards a field classification, the sand is taken from a comparatively deep pit or bank and is given a mechanical treatment either by wet or dry sizing or both so as to control the grain size and amount of bond. This grade of sand has been in much demand for certain special fine grade castings and considerable success has crowned the efforts of those who have entered this field of sand production.

Before making any attempt to secure a production of molding sand from a property it is the custom to make a number of tests by means of pits, trenches or auger holes and estimate the quality by the feel. As soon as active productive operations are in force a section of surface soil is stripped and the material required removed by shovels or sharp spades. Usually the foreman will thoroughly test the ground in advance of the workings by means of an auger or more commonly by means of a special tool constructed after the style of a butter tester. The material is transported by wagons to the loading terminal and there placed in stock piles or loaded at once on cars or boats. Hauls of as much as three miles are not uncommon. The usual custom in buying sands from the land owner is by contract so that a minimum number of cars will be removed every year and the land finally left in good condition for agricultural purposes. All work of production is at the expense of the producer.





Figs. 2 and 3—Variation in Grain Diameter—Two Samples Submitted by Different Parties, and Designated as 00 to 4 Inclusive

Mineralogy

The molding sands are practically a pure quartz sand. Feldspars are present in most instances, sometimes reaching as high as 5 percent. Mica is generally present. Garnet is rather abundant in the deposits of the middle valley. Fluorite and apatite were observed in several samples. Gypsum and calcite were abundant in the form of perfect crystals and clear fragments of irregular outline. Small fragments of quartzite and shale were extremely abundant and pyrite was locally in evidence. In some regions hornblende was extremely abundant with rather heavy traces of augite. This represents the mineralogical composition of the under sands, the sands as originally deposited.

As the land became elevated and the waters drained away vegetation and the ground waters began to affect the mineralogical composition. The organic acids of plant decay, carbonic acid of the atmosphere and sulphuric acid of pyrite decomposition circulating in weak solutions throughout the sands began the action with a decreasing effect downward from the surface. The calcium minerals were brought from the condition of a carbonate to that of a sulphate. The ferro-magnesium minerals were decomposed leaving a residual quartz accompanied by flakes of iron oxide. At the junction of the upper and under sands these flakes of iron oxide were of a reddish color similar to that of freshly precipitated ferric hydroxide; near the surface these flakes took on a lighter color of typical limonite. The iron oxide flakes have been present in some screened samples to the extent of 15 per cent. The feldspars gave a product which, according to chemical analysis, might be classed as kaolinite. Owing to the comparative softness of the feldspars as compared with quartz the alumina minerals are found in greater abundance among the finer portions of the sample. There is a constant decrease in the hydrated minerals and increase in undecomposed minerals in depth.

Grain Size and Form

In the laboratory examination of the sands it has been my aim to carry all the tests through under the same conditions. The two samples examined and shown graphically by Figs. 2 and 3 were submitted by different parties, designated under the trade classifications from 00 to 4 inclusive. They were taken from two different districts and had been graded by the usual commercial methods.

The original samples were allowed to dry at room temperature and then passed dry through a 20-mesh sieve to remove pebbles and other foreign materials. The sample was then passed through a Jones sampler for a sample of 100 grams approximately. This was thoroughly mixed and a working sample of 25 grams removed. The working sample was dried at 100 deg. C. to constant weight, placed in water for 24 hr. and then mechanically screened into five grades having diameters of 0.0411 in., 0.0211 in., 0.0129 in., 0.0082 in., and 0.0047 in.

This screening was carried on under wet conditions using a stream of water of constant head and with a flow of 1000 cc. per min. to force the material through the screen. The material below 0.0047 in. was allowed to settle, the water decanted and the residue passed through a 3-cone modified Schultz apparatus delivering three samples having diameters of 0.0035 in., 0.0021 in. and 0.0010 in. The apparatus was operated under conditions of constant head and with a flow of 250 cc. per min. The eight samples were dried to constant weight and examined under the microscope. A chemical

analysis was made under standard conditions on one set of samples.

It will be observed on examining Figs. 2 and 3 that the percentage of grain diameter varies. This is due to the fact that the two samples carry varying amounts of an iron and silica bond which binds the smaller particles into irregular bunches of sand grains. When these bunches are bonded strong enough to resist the action of the wash water they have been considered as solid particles. Almost without exception the grains composing the cemented material have a diameter of approximately 0.0035 in.

The free quartz grains of the molding sand occur in several forms: A clear transparent irregular grain with conchoidal fracture, limonite stained material of the same character; rounded abraded quartz free from iron stain; rounded quartz with limonite stain; flat thin flakes of clear quartz. The last is found only in the finer material. The feldspars appear in their usual bluish pearly cleavage pieces and with the quartz make up the bulk of the sample. Hornblende often occurs in slender abraded crystals and very abundantly in some samples as rounded grains. The garnet occurs in the form of red rectangular flattened fragments.

The mineralogical and physical conditions of the various deposits vary to a great extent. The percentage of cemented material and form of the quartz grains, rounded or irregular, determine to a great extent the grade of the sand. The percentage of feldspars and ferro-magnesian minerals in the original sands determines the amount and character of the bond.

Upon examination of Figs. 2 and 3, I believe it will be seen how difficult it would be to make a standard specification for molding sands based on grain size. It would be impossible to produce commercially two shipments from any region which would live up to such a specification and yet for all practical purposes the sands would perhaps pass the working test.

Chemical Analysis of the Sands

The chemical analysis of the various sands vary according to their physical condition and with their derivation. Sands derived from siliceous rocks such as quartzites will be low in alumina and low alumina sands have a low percentage of bond. Sands derived from the disintegration of granitic rocks will be comparatively

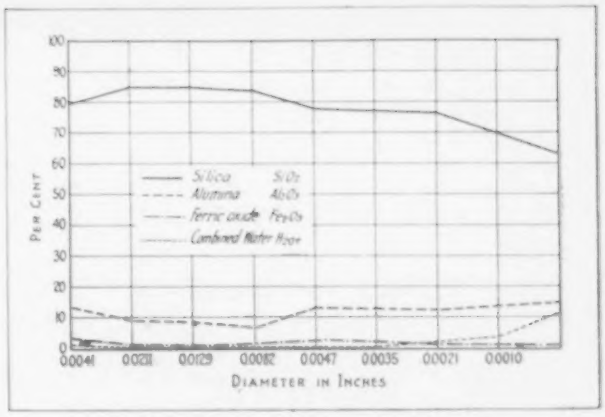


Fig. 4—Percentage of Silica, Alumina, Ferric Oxide and Combined Water, Grade 4

high in alumina with a higher percentage of bond. Sands carrying a comparatively high percentage of calcium carbonate (above 2 per cent) may appear to be of a certain grain size when first used but soon break down from the effect of the heat. The percentage of calcium carbonate is the only chemical feature which affects the value of the sand. The percentage of combined water is fairly constant and is never very high. An analysis of the bond of one sample gave 10.88 per cent with the bond less than 10 per cent of the entire sample.

The following analyses are given of two typical sands and three washed products. The samples of washed products, coarse, medium and fine, show that the percentage of silica, alumina, etc. does not vary regularity with the grain size:

	No. 1	No. 2	No. 3	No. 4	No. 5
Water, H_2O	0.45'	0.14'	0.28'	0.11'	1.22'
SiO_2	77.48'	86.16'	78.96'	83.78'	62.55'
Al_2O_3	11.77'	5.29'	13.16'	7.19'	15.23'
Fe_2O_3	1.68'	2.62'	3.77'	1.34'	1.48'
CaO	1.34'	0.90'	0.71'	1.55'	1.71'
MgO	0.21'	0.78'	0.35'	trace	0.09'
K_2O	2.26'	1.04'	1.01'	2.89'	4.16'
Na_2O	1.51'	0.60'	0.54'	2.06'	2.07'
H_2O	2.49'	1.07'	0.92'	0.72'	10.88'
TiO_2	0.48'	0.16'	trace	0.11'	trace
CO_2	0.69'	0.28'	trace	trace	trace
SO_3	0.11'	0.09'	trace	trace	trace

No. 1. Sample of commercial high alumina Albany sand.
No. 2. Sample of commercial high silica Albany sand.
No. 3. Sample of screened Albany sand, grains 0.0411 in. dia.
No. 4. Sample of screened Albany sand, grains 0.0082 in. dia.
No. 5. Sample of screened Albany sand, grains 0.0010 in. dia.

Nos. 1 and 2 are taken of two extreme sands as regards chemical analysis and yet their mechanical analysis gave practically the same results.

Bronze Tablets Dedicated

YOUNGSTOWN, OHIO, June 2.—About 20,000 people participated in the Memorial Day celebration for employees of the Youngstown Sheet & Tube Co. at Campbell Park, in honor of the 1800 employees who served in the war. The exercises lasted throughout the day and included speechmaking, athletic contests and diversions of all kinds. Leroy Manchester, secretary and attorney, delivered the address at the dedication of a bronze tablet erected in memory of Sheet & Tube company employees who lost their lives in the war. Private John Campbell, one of the returned men, delivered the response. The tablet rests on an immense boulder. Beside it, on either side, are two smaller tablets bearing the names of the men who made the supreme sacfice. The outing was under general direction of a committee headed by James M. Woltz, safety director.

Employees of the Haselton, Ohio, furnaces of the Republic Iron & Steel Co. who served in the war were honored Memorial Day, when a bronze tablet, inscribed with the honor roll, was unveiled. W. J. Williams delivered the dedicatory address, while W. A. Haven, superintendent of the northern furnaces, made the address of welcome to the returned men. The tablet was unveiled by H. L. Burnham, general master mechanic. Responses were given by S. L. Carroll for the sailors and G. F. Geddis for the soldiers. The tablet is located near the furnace office building. About 1000 employees witnessed the exercises.

A joint meeting of the New Haven Branch of the American Society of Mechanical Engineers and of the Yale Mechanical Engineers' Club was held at the Mason Laboratory, Yale University, New Haven, Conn., May 27. An address on "Labor Problems" was given by Harry Gordon Hayes, assistant professor of political economy. There was also, through the courtesy of the Navy Department, an exhibition of new aviation motors. These were described by Professor Wohlenberg.

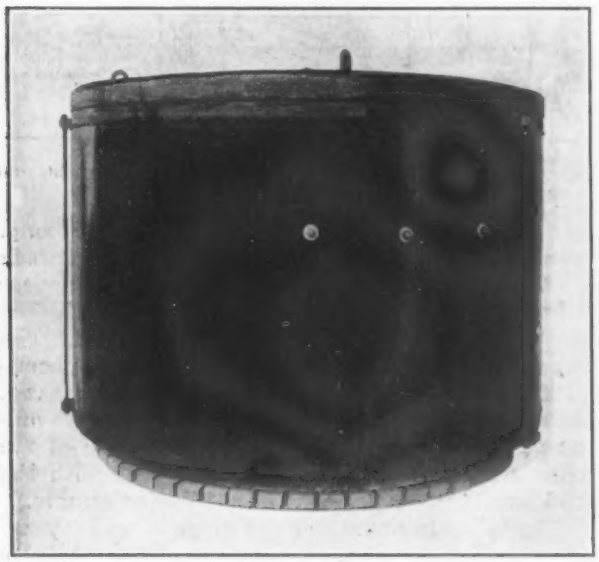
The Société d'Ougrée Marihaye, in Belgium, has started the Rodingen works, which have been at a standstill during the war. Two of the four blast furnaces are already in operation.

NEW TYPE ELECTRIC FURNACE*

Developed for War Needs—Commercial Applications Now Sought

BY A. M. CLARK†

A new type of electrical resistance furnace used with success in heat treating gun forgings and in shrinking the jackets on gun barrels of large caliber



One Section Furnace Developed for Shrinking Jackets on Gun Barrels by the General Electric Co. The company's engineers are now seeking to adapt the furnace to peace-time needs such as drawing and annealing carbon steels, brass and copper, baking vitreous enamels, etc.

was developed by the General Electric Co., Schenectady, during the war period.

Two forms of furnace were made, a high temperature resistance furnace creating a temperature of 1800 deg. Fahr. used in tempering and hardening gun forgings, and a low temperature furnace for use up to 950 deg. Fahr., primarily for shrinking jackets over gun barrels but applicable to other practices, including shrinking collars on crank shafts, rims on wheels, etc.

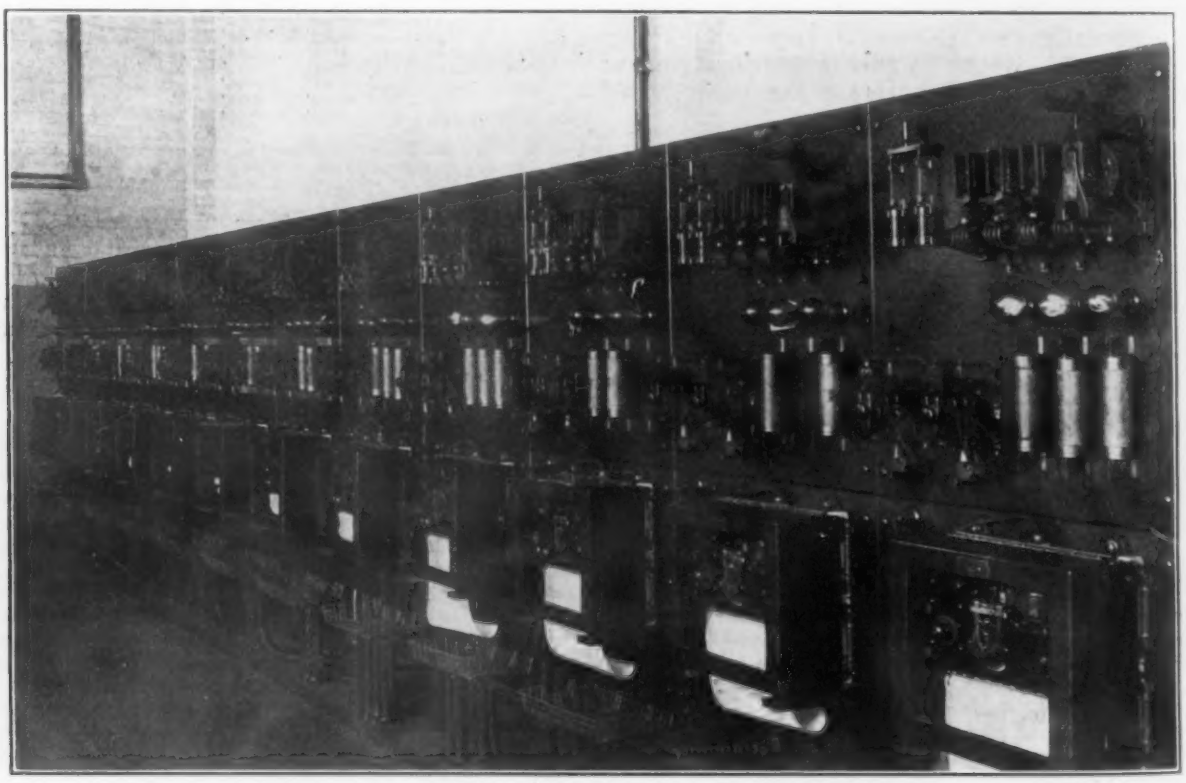
This type of shrinking furnace is constructed in sections and has been built up to a depth of 88 ft. The best example is installed in the Washington Navy Yard where guns of large caliber were built during the war. The furnace is of the vertical cylindrical type and is sunk into the ground to the required depth.

Furnaces consisting of more than one section are usually equipped with a hand control which permits bringing the charge up to temperature at a uniform rate throughout the length of the furnace, the maximum temperature used being approximately 950 deg. Fahr. When a one-section furnace is used, it is ordinarily provided with automatic control.

A complete one-section furnace consists of a cylindrical section, cover, base and work base. The cylindrical section consists of top and bottom castings with supports, inner and outer casings inclosing the insulating material, and heating units and guards. The cast rings which form the ends of the section are recessed in such a manner that the sections can be stacked one above the other, which permits constructing a furnace of any desired height from standard sections. Provision is made for the unequal expansion of the inner and outer casings due to difference in temperatures. There is a minimum of metal from the inner casing to the outer casing thus to reduce the heat losses.

The heating unit consists of a calorite ribbon mounted on a cast-iron supporting plate, and insulated therefrom by suitably refractory material. A number of units are connected in series depending upon the voltage of the power supply.

The construction of the vertical-cylindrical high temperature heat-treating furnaces involves the use of a heavy calorite ribbon supported on the inner walls.



Automatic Panels and Control Instruments for Large Electric Furnace. The furnace is divided into a number of separate heating zones with an automatic temperature control for each zone

The furnace is divided into a number of separate heating zones with an automatic temperature control for each. The walls consist of an inner lining of refractory brick and insulators backed up by a double course of heat insulating brick and protected by a sheet

*The application of this furnace to the heat treatment of gun forgings at the Tioga Iron & Steel Co., Philadelphia, was described in THE IRON AGE, issue of March 13.

†Industrial heating department General Electric Co., Schenectady, N. Y.

metal casing. The ribbon supports and insulators are both of molded special compound laid in the lining of refractory brick with a spacing block of the same material placed between the insulators of adjacent windings, or zones. The insulators, spacers and spacing blocks are fitted at the back into a steel channel which is in the form of a ring made up of a number of sectors tied together by bolted clamps. An opening is provided in the spacing block for the charge pyrometer tube, with a similar opening for the ribbon pyrometer in the support insulator. The ribbon insulators are protected from mechanical injury by the spacing blocks and the shape of the former is such that any scale or dirt cannot accumulate and cause short circuiting of the ribbon winding but will fall to the bottom of the furnace. The ribbon insulators being imbedded and forming a part of the furnace wall hold the ribbon firmly in place and eliminate the need of any form of metallic support with the inherent weakness of the latter at high temperatures. Furthermore, the omission of all metal, except through ribbon windings, insures quick heating of the furnace and reduces to a minimum the waste of energy due to the storage of heat.

Each section is provided with a control panel, and is controlled independently of the other sections. This is accomplished by sensitive automatic controlling instruments, one for each section, operating in conjunction with suitable relays and a contactor, so that when the temperature reaches the value for which the instrument is set, the relays and contactor are operated to disconnect the section from the power line. When the temperature has fallen only a few degrees the relays and contactors are operated in the reverse order, again connecting the section to the line.

The instrument may be set to hold any desired temperature, and is provided with a paper roll and recording mechanism. The temperatures are measured by thermocouples, two for each furnace section, one placed near the resistor and the other against the charge.

With the cessation of hostilities and the practical abandonment of munition work, engineers are turning their attention to the use to which these furnaces can be put in industrial work, as there are a large number of heat-treating processes in the manufacturing industries requiring temperatures from 900 to 1800 deg. Fahr., such as drawing and annealing carbon steels, drawing high speed steels, annealing brass and copper and baking vitreous enamels.

Boat Repaired After Destructive Work of Germans

WASHINGTON, June 1.—The steamer *Callao*, formerly the *Sierra Cordoba* of the North German Lloyd, has arrived in New York ready for Army transport service. This ship was repaired in the Panama Canal shops at Panama and is an interesting demonstration of the efficiency of that establishment. The *Callao* was one of the four best-equipped passenger vessels, although it had a gross tonnage of only 8226. She was one of the steamers interned in Peru and taken over by the Government of the United States. She had been wrecked by the German crew as completely as possible.

"When this vessel was towed into Balboa by the dredge *Culebra*, which had been dispatched to Peru for this purpose," says the official statement of the Panama Canal Commission, "she was in a very dilapidated and crippled condition, due to her long internment and to destruction wrought by the German crew. Practically no work of repairs had been carried on after Germany's declaration of war, leaving the hull in very poor condition and badly corroded.

"The destruction of the main and auxiliary machinery was carried out in a most systematic and thorough manner by her former operators. Cylinders of the propelling engines were badly damaged by explosives; main valves, air pump gear and other miscellaneous brasses and fittings were dismantled and thrown overboard. Important and essential castings of the auxiliary machinery suffered a similar fate by sledge, or could not be accounted for. Especial care was taken to destroy or remove such parts as would render extensive design work necessary for their replacement.

"With the designing of the missing parts, renewing parts from samples and repairing castings by electric and acetylene welding processes, the vessel, taken in a wrecked condition, was repaired and turned over to the United States Shipping Board, equal in all respects to her original design. This work represented approximately 400 separate jobs, all completed within six months after her arrival at the Balboa shops."

Increased Demand at Youngstown

YOUNGSTOWN, OHIO, June 2.—Business is improving in practically all finished and semi-finished lines. Consumers of tin plate, especially in Chicago and Pittsburgh, are in the market for various sized tonnages, some of them very substantial. Orders are also being placed in good quantities. Wire mills are also running close to normal, with plenty of business being placed and in sight. A number of contracts have been made with manufacturing consumers of wire and wire products up to Oct. 1 and some up to Jan. 1. Jobbers are purchasing more freely. Local mills have well sustained fencing orders.

Soft steel bars are in more plentiful demand and it is predicted contracts will be the rule within the next 60 days, replacing the system of buying only against immediate needs. One maker here has orders for 6500 tons of Bessemer soft steel bars and for 3000 tons, for third quarter delivery.

Demand for Bessemer sheet bars is also picking up and is said to surpass that for the open-hearth grade. The Erie Railroad has inquired for 100 tons of sheets for box-car ends. A carload of galvanized sheets was recently shipped to a Pacific Coast jobber. Pipe demand is better.

Sweden Needs American Machinery

WASHINGTON, June 1.—The Bureau of Foreign and Domestic Commerce has received a report from its trade commissioner at Stockholm detailing the needs of Sweden for American machinery. Before the war, America furnished only 15 per cent of that country's imports of machines and appliances, while Germany furnished 50 per cent. That figure ought at least to be reversed.

The report declares that there is now a demand in Sweden for milling machines, including hand, vertical, horizontal and universal types; turret and automatic lathes; single and multiple drilling machines; presses, single movement, double movement and friction types; shaping machines; tool grinders; shear machines; buffing machines; filing machines; electric welding machines, both spot and seam; cutters, twist drills; threading tools; reamers; gear cutters; measuring tools, micrometers, gages; emery grinders; files; hack saws; welding and soldering apparatus; setting-up tools; wrenches; chucks, especially electromagnet and compressed-air types; bits; hand and machine vises and transportable compressed-air tools.

"An important thing to be borne in mind," says the report, "is that all measuring machinery and apparatus must be gaged in millimeters, to conform to the European standard of measurement. Sweden is looking forward to a period of unusual industrial activity. All the old factories are preparing to increase their output, and many new concerns are being established. American exporters will find an ample market for their products in Sweden, provided they set about forming the necessary connections. The occasion calls for immediate action, and American firms should avail themselves of this opportunity."

High Speed Milling Machine

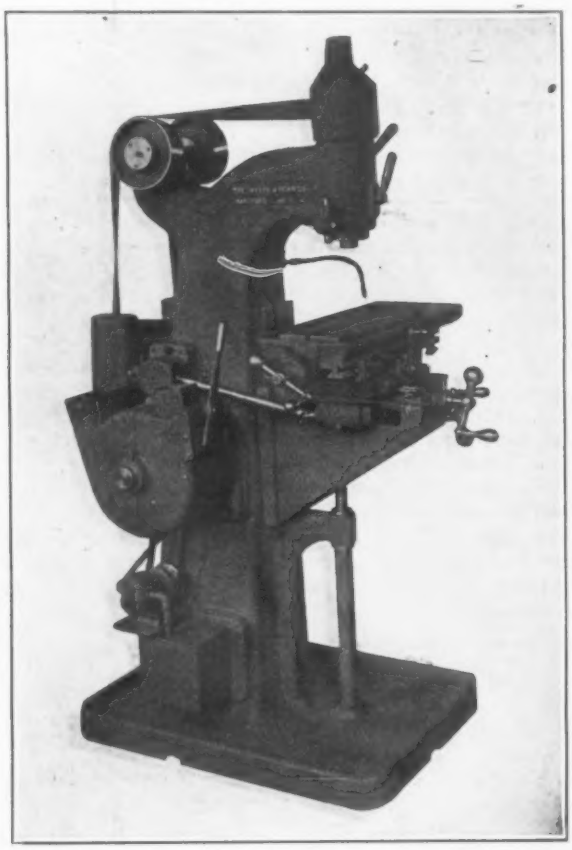
A machine intended for various light vertical milling cuts and designed to run at high cutter speeds, has been placed on the market by the Taylor & Fenn Co., Hartford, Conn. The machine is self-contained and is operated with a single 2-in. belt. The power is taken from the main line shaft to the tight and loose pulley on the left hand side of the machine and delivered directly to the driving pulley on the back of the machine.

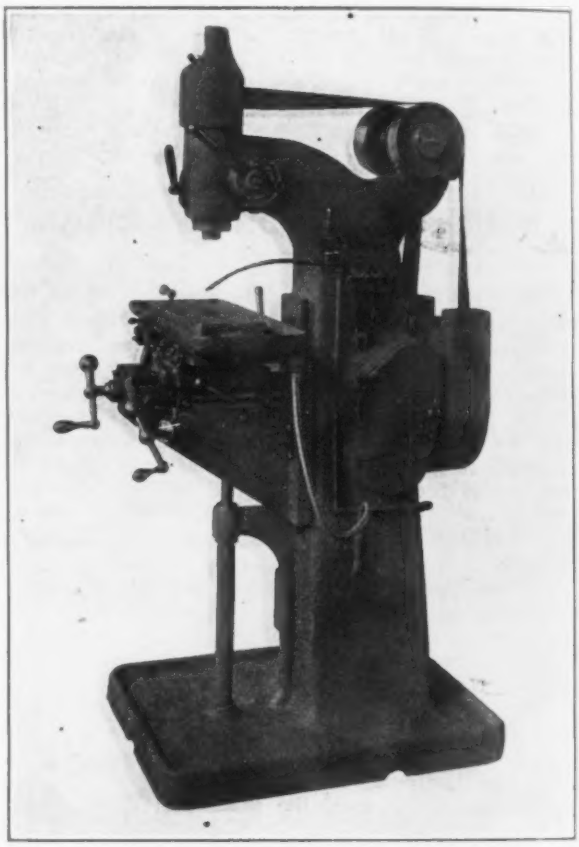
When a motor is desired, a bracket is attached to the base of the machine, and the motor is belted direct to the pulley. The tight and loose pulley is guarded and the belt shifter is entirely inclosed within the guard and slides on two shafts which keeps the shifter in a vertical position. The main driving shaft extends through the machine and is connected by bevel gears with the guarded spindle driving pulley on the back of the machine. An endless belt extends from the spindle driving pulley over two idlers to the spindle pulley. By removing the cover on the back of the spindle driving pulley guard, this belt may be taken off or replaced. The idler pulleys are adjustable to allow for stretch of the belt.

Various speeds of the spindle and longitudinal feed to the table are obtainable through gears placed in a gear box on the right hand side of the machine. Adjustable stops are provided for the cross feed, longitudinal power and hand feed. The stops for the longitudinal feed are so designed that when the hand feed is used, the power feed can not become engaged.

A central reservoir system is in the table of the machine from which the oil is conveyed to important bearings on the slides. The pump is a self-contained unit. The tank to which the pump is attached extends inside the column of the machine. The whole unit can be removed.

Eleven ball bearings are used thus making for economy of power and for high spindle speeds. The spindle is counterbalanced by a spring working directly with the rack for moving the spindle up and down. This spring may be adjusted to make a quick return of the spindle when required. A positive stop is provided on the quadrant for feeding to depth. Double row thrust ball bearings are used on the table screw and ball thrust bearings on the elevating screw.





High Speed Milling Machine for Vertical Cuts. The box on the right hand side of the machine contains the gears which provide various speeds of the spindle and longitudinal feed of the table. The longitudinal movement is 11 in.; cross movement, 6 in.; vertical movement of spindle, 2 in.; maximum distance from end of spindle to top of table, 10¼ in.; center of spindle to face of column, 9 in.

Portable Drill with Taper Socket

A new size portable electric drill has been added to its line by the Black & Decker Mfg. Co., Baltimore. This drill has a capacity of 9/16-in. in steel, and is provided with a No. 1 Morse taper socket. The manufacturer states that it will drill a 9/16-in. hole through machine steel at a rate of 1½ in. per min. without overloading the motor. This tool, with the exception of the socket, is similar in construction and appearance to the one described in THE IRON AGE, issue of May 8, on page 1238.

A feature of the tool emphasized is the attachment of the Morse taper socket. This is in the form of a separable sleeve secured in the drill spindle by a large knurled nut. By unscrewing this nut the entire taper socket can be removed from the spindle. The drill shank protrudes slightly beyond the end of the socket, and a light tap on the end of the protruding drill shank, it is stated, frees it from the socket. This makes the drill compact, and gives it strength and wearing qualities, as otherwise it would necessarily be at some distance from the bearing in order to leave room for the drift pin slot.

Iron Ore Analyses

The booklet of the Lake Superior Iron Ore Association, giving complete average cargo analyses of Lake Superior iron ores of 1918, has just been issued by the secretary, W. L. Tinker, Perry-Payne Building, Cleveland. An interesting feature is the recognition for the first time of what is known as "East Mesaba sinter," the analysis being of a small cargo of sinter produced from an experimental mill by W. G. Swart and associates, of Duluth, Minn., who have been treating lean ores by means of magnetic separation, as stated in THE IRON AGE of Jan. 2, 1919, page 50. The ore analyzes 63.27 iron dry, 0.008 phosphorus, and 10.38 silica.

INDUSTRIAL RELATIONS PLAN

Outline of Procedure for Elimination of Waste and for General Improvement

Research conducted by A. W. Burritt, R. H. Booth, C. H. Grasser, H. L. Sutton and George S. Hawley, composing a sub-committee of the Committee on Technical Education of the Manufacturers' Association of Bridgeport, Conn., shows there is a waste of over a billion dollars a year caused by labor turnover in the United States, and that in Bridgeport alone the loss exceeds a million dollars yearly. The investigation indicated that 75 per cent of this waste can be saved by proper and effective plans. A large amount of money is also lost by industrial strife year after year. In addition to these losses the cost of production is much higher than it need be, for very few employees attain a proper degree of efficiency. Then there must be added the expense caused by absenteeism, making the total waste tremendous. In view of these facts, the sub-committee asked what could be done to reduce waste and make it possible to maintain good wages, yet keep down the overhead and permit an employer to compete with other cities and countries where labor is cheaper. The inquiry resulted in a plan which the sub-committee believes, if fairly followed, will cope with the situation to a considerable extent. The plan is confined solely to supervisors such as foremen and superintendents, providing for their instruction in the policies of the employing company; impressing upon them that the management of men is of great importance, and that more can be accomplished by leading than by driving, more by co-operation than by antagonism.

To achieve the object sought, three steps are suggested in a report prepared by the committee, as follows:

1. To train and develop the supervisors into what might be termed human engineers.
2. Selection and fitness of the employee for his work.
3. To educate the employee in the best and most efficient methods of performing his work.

The sub-committee sets forth some of the things desired, as follows:

The employer wants:

1. Industrial peace.
2. Improvement in quality and quantity of production.
3. Reduction in the cost of production.
4. Higher efficiency on the part of the employee.
5. Attentiveness and interest of the worker in his work and in his fellows.
6. Loyalty and confidence on the part of the employee.

The employee wants:

1. Higher wages.
2. Better personal relations.
3. Good working conditions.
4. A square deal.
5. Steady work.

These wants, the committee believes, can be attained by co-operation, confidence and patient persistence. It declares the following to be essential to ideal conditions:

1. Factory conditions, cleanliness, ventilation, sufficient room, proper tools, etc., should receive careful attention
2. The attitude of the management to the employee should be such as to inspire confidence and loyalty, and produce a real belief in the fairness and honesty of the management.
3. Means should be provided within each factory to instruct every employee in the best methods of work.
4. The employee should be given information as to the amount and quality of his production; and good work should be recognized.

The committee suggests the following procedure:

1. That from each factory there be appointed a man, preferably an executive, who may be known as the manager of industrial relations. He shall perform the duties suggested by his title, instruct the supervisors in the policies of the company, attend the various meetings called, follow up suggestions made and see that they are properly carried out.

2. The Manufacturers' Association should at once arrange one or more general meetings of supervisors, at which the plans, methods and means for securing results desired will be described by men of experience.

3. Supervisors' meetings should then be called in the individual plants, or groups of smaller plants, which meetings shall be addressed by local men who are experts in the various lines which will be discussed, with the view of developing in a practical way the points which should be covered.

4. In addition to the matters already suggested some of the points to be taken up are:

a. Fundamentals.
b. High cost of waste.
c. Responsibility.
d. The cost of labor turnover.
e. Methods of reducing labor turnover.
f The elements in overhead as affected by each department.
g. Conduct toward new employees as well as old.
h. Loyalty.
i. Neatness.
j. Recognition for results.
k. Discipline.
l. Instruction of workmen.
m. Poor work.

The supervisors should in some practical way be recognized for accomplishing good results along the lines indicated, thus giving them a definite personal and monetary interest in the progressive work of the departments.

5. As before stated, the manager of industrial relations should constantly and consistently instill in the minds of the supervisors the policies and the spirit of the management, so that they in turn may properly interpret them to the employees, and so build up a spirit of confidence and co-operation.

In properly following out the plan here outlined, belief was expressed that labor turnover can be materially reduced, that matters within the factory can be amicably adjusted, the efficiency of the employee increased, absenteeism reduced, and larger financial returns produced for worker and employer.

The report was unanimously adopted by the full Committee on Technical Education Feb. 20 last. The executive board of the association took it up for action March 6, and unanimously voted to accept the report and to recommend its adoption by manufacturers. Two general meetings of local supervisors have already been held in Bridgeport. At the last there were present 1250 persons. A number of local plants have taken up the proposition and are at work upon putting into practice the several recommendations.

Charles M. Schwab Honored by Citizens of Bethlehem

Charles M. Schwab was signally honored recently by the citizens of Bethlehem, Pa., when he was presented a solid gold medal at appropriate exercises held in the Bethlehem, Pa., High School auditorium. A. Wilbur, who was largely responsible for the movement to present the medal to Mr. Schwab, was chairman of the meeting. The Bethlehem Steel Band rendered a musical program, and Dr. J. Fred Wolle, director of the Bach Choir, was songmaster.

The presentation address was delivered by Bishop C. L. Moench, of the Moravian Church. Mr. Schwab, in responding, made one of his characteristic addresses. The medal is of solid gold, ⅛ in. thick and ¾ in. square, with clipped corners. The face of the medal, in sunken cross panel at the top, illustrates the manufacture of steel in the Bethlehem plant, as organized on a war basis. Below the panel, this inscription appears:

To Charles M. Schwab as an appreciation of invaluable services rendered our nation, from his fellow citizens of the City of Bethlehem, Pa. 1917-1919.

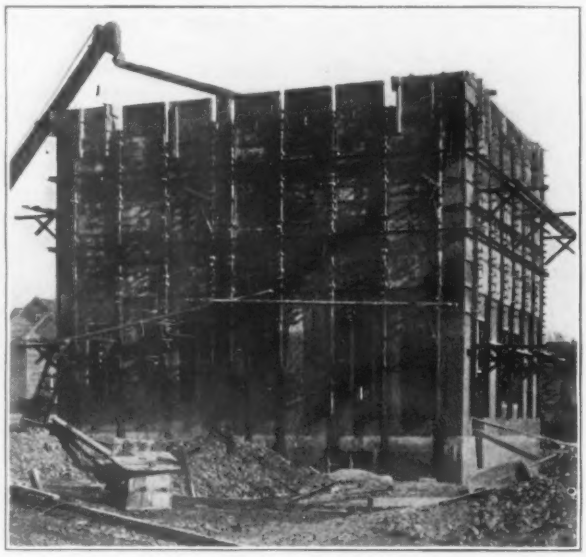
The obverse side of the medal presents three panels, two of which are directly illustrative of Bethlehem as a city, showing the steeple of the Moravian church in the one panel and of Lehigh University in the other. The third and broad panel shows a staunch ship on the ways, ready for launching.

BUILDS HOUSES FOR WORKMEN

Hydraulic Pressed Steel Co. Sells Homes to Employees at Cost

Considerable progress has been made in the past two or three years in the development of the reinforced concrete house as a moderate-priced residence for factory employees. It was only a few years ago that the first reinforced concrete houses, in the construction of which steel forms were used for pouring the concrete, were built. These houses were of the bungalow type. Recently this form of construction has been applied with success to the building of two-story houses, and an interesting example of what can be accomplished in the erection of reinforced concrete houses as a solution of the housing problem is found in the erection of 10 houses of this type by the Hydraulic Pressed Steel Co., Cleveland.

This company decided that it could be of assistance to its employees by building modern types of residences and selling them to the men at cost with liberal terms of payment. The company purchased all the lots on a new street and on a portion of these has just completed 10 houses. These are on lots 40 x 150 ft. Every alternate lot is left vacant, and on these the company plans to erect bungalows of the same type of construction.



The Buildings Are Poured in Three Sections, the Basement, First and Second Stories

The houses are 23 x 27 ft., two stories and basement, and are conveniently arranged and attractive in appearance. They have six rooms and bath; a living room, dining room and kitchen on the first floor, and three bedrooms and a bath room on the second floor. All the rooms are good-sized. The houses are built from the same floor plan, but each one is of a different type so that the monotony of uniformity is avoided. The variation in exterior design is effected by using different roof, porch and window plans. Some have flat concrete roofs and others pitch roofs.

The oustide walls are furred to prevent condensation, and it is pointed out that this type of construction provides dwellings that are warm in winter and cool in summer. The houses are fireproof, practically the only wood being the trim and the hardwood floors, the latter being laid on concrete. The flat roof houses have concrete roofs covered with prepared gravel roofing. The houses with pitch roofs have wood rafters below which are suspended metal lath ceilings covered with cement plaster.

The buildings are poured in three sections, the basement, first and second stories. Standard building columns, made by the Hydraulic Co., are used in the concrete work, being of the same type as are provided for concrete wall construction, and permitting the pouring of any dimension in multiples of 4 in. A new type of paddle conveyor with a boom 40 ft. long was used for handling the concrete. The concrete was poured at the rate of 10 yd. per hr. or as fast as the mixer could prepare the material. At this rate a story was poured in 3½ hr., or the complete house of two stories and basement in 10½ hr.

With improved handling equipment and construction methods it is stated that the cost of mixing and placing the concrete was reduced to $1.50 per cu. yd., which is regarded as low for a light wall. Each floor took 35 cu. yd. of concrete, or 105 cu. yd. for an entire house. The cost of forming averaged 7 cents per sq. ft. of wall surface. The total cost of the material, including mixing and placing, was about $10 per cu. yd.

The total cost of the houses was approximately $4800 each. This included grading, sidewalk, plumbing, installation of a warm air furnace, electric wiring and fixtures, decorating, window shades, etc. The houses were built at high prices, as the contracts were let early last fall. Work was started in October, and the houses are now ready for occupancy. It is stated that houses of wood of practically the same size built on an adjoining street at the same time, cost from $4300 to $4500, or from $300 to $500 less than the concrete houses. This increase in cost is regarded as slight when one takes into consideration the advantages concrete houses possess over those of wood construction in their comparative durability and their fireproof qualities.

The company will sell the houses to its employees at cost. As the lots cost $700, the total cost will be $5500.

Arrangements will be made with a bank to carry a loan on the houses for the purchasers. As the only profit that is to be figured in the selling price is the profit that the contractor has made on the work, it is expected that a bank will loan approximately $3500 on each house instead of only about 50 per cent of its selling price as is the usual rule of Cleveland banks. Purchasers will make a small payment down of about $250 and pay monthly installments to the company of about $40 with a low rate of interest, probably 5 per cent on the unpaid balance.

A steel having a tensile strength ranging approximately from 120,000 lb. to 270,000 lb. per sq. in., and an elastic limit ranging approximately from 100,000 lb. to 225,000 lb. per sq. in., which contains molybdenum in addition to the usual constituents in quantities ranging from a fraction of 1 per cent. to not materially more than 1 per cent. is covered by a patent (U. S. 1,278,082) granted to C. H. Willis, Detroit. The resulting alloy steel is claimed to have certain salient properties and to be workable.

Manganese ore imported from Cuba into the Untied States increased from only 550 gross tons in 1915 to 67,780 tons in 1918.

CHROMIUM IN STEEL

Rapid Method of Analysis Depending Upon Electrometric Titration

BY G. L. KELLEY AND W. C. WRIGHT*

Steel chemists who have occasion to determine chromium in preliminary furnace tests while the steel is held in the furnace in a molten condition are often at a loss for a method which is at once accurate and rapid. The method described below is offered to overcome this lack. At the same time, however, we wish to point out that it is subject to the serious limitation that it is difficult to carry out satisfactorily when chromium carbide is set free on solution in more than small amounts.

Preliminary furnace tests, even from electric furnaces, rarely contain more than 1 per cent carbon, 2 per cent chromium and 0.50 per cent manganese. Such tests after pouring are usually quenched from a temperature above the critical, followed by a short "draw" at about 1200 deg. Fahr. This is because they would otherwise be too hard to drill. The actual procedure is rough but generally effective. As soon as the test has hardened in the mold it is thrown into water from which it is taken when the red color has completely disappeared and placed just inside of the door of the melting furnace. On reaching a temperature above dark red but well below the critical range, it is removed, quenched and drilled. A more certain treatment consists in placing the quenched test in a gas or oil heated furnace of considerable capacity which is maintained at a temperature of 1700 to 1800 deg. Fahr. From one to three minutes at this temperature, followed by a quench, usually softens the test enough to permit of drilling with a good high-speed steel drill. The length of time required for the draw depends upon the size of both the furnace and the test piece.

Steels of this composition, whether or not they contain nickel and which have been treated in this way, may be safely analyzed by this method. Steels which have been subjected to the more elaborate heat treatments which usually precede their application in the commercial uses for which they are made, or which have been forged, so often contain chromium carbides in large quantities that this method is not available in such cases. Here some method must be used which involves solution in sulphuric acid followed by evaporation until salts separate. Occasionally a sample is found where even this drastic treatment fails to make the chromium available for solution. But although sulphuric acid is more effective in decomposing chromium carbides than any other acid, it cannot be employed where speed is a factor in the choice of a method. It is for this reason that we have abandoned it in favor of nitric acid.

The method described here depends upon the oxidation of both chromium and manganese in a nitric acid solution with sodium bismuthate. The persistence of the color of permanganic acid for some time after the addition of the bismuthate serves as an index of the success of the oxidation. Since it often happens that preliminary furnace tests contain less than 0.10 per cent manganese, 0.20 g. of manganous sulphate was added to one liter of dilute nitric acid of sp. gr. 1.13 to insure the presence of a convenient amount of manganese. Fifty cubic centimeters of the acid were used to dissolve a 1 g. sample of steel. The manganese thus added amounted to about 0.25 per cent. With the aid of heat, solution was complete in one or two minutes. Adding hot acid to the drillings shortened the time required for solution. Gentle boiling for an additional minute sufficiently freed the solution from most of the oxides of nitrogen still remaining. The solution was then moved to a cooler place and 25 cc. of boiling water added, followed by two grams of sodium bismuthate. The solution was again brought to a boiling temperature. After 30 sec. the bismuthate usually disappeared and sometimes it was followed by the disappearance of the permanganic acid. When this happened a second addition of two grams of sodium bismuthate was made. Under these circumstances, if the color of permanganic acid persisted during gentle boiling for two full minutes after the sodium bismuthate had dissolved, the results were always correct within the limit of error.

In connection with the oxidation of chromium by sodium bismuthate in a boiling nitric acid solution, we have observed that satisfactory oxidations were not obtained unless the concentration of nitric acid fell within a comparatively narrow range. When we added sodium bismuthate to the nitric acid solution of the steel without the dilution described above, the color of permanganic acid was noticeably fugitive and there were some instances in which the chromium was incompletely oxidized. This procedure had the further disadvantage with manganese present to the extent of 0.50 per cent that a precipitate of manganese dioxide was produced which gave trouble at a later stage in the analysis. When 15 to 35 cc. of water were added before the bismuthate was introduced, manganese up to 0.75 per cent caused no trouble, the permanganic acid was more stable and the chromium was completely oxidized. With a still greater dilution, however, the oxidation of chromium was incomplete although the permanganic acid continued present during several minutes. Diluting the acid with this amount of water before dissolving the steel lessens the rate of solution and interferes with the decomposition of chromium compounds.

It was generally found that when less than one-half per cent of both carbon and chromium was present, a single addition of sodium bismuthate was sufficient. When two additions were not enough the difficulties in the way of satisfactorily completing the analysis were such that time was saved in using some other method. We did not, however, find any instances within the limits of composition and heat treatment given above where more than two additions were necessary.

After completing the oxidation with sodium bismuthate, the solution was diluted with 125 cc. of boiling water, 40 cc. of sulphuric acid, sp. gr. 1.58, and 15 cc. of dilute hydrochloric acid made by adding one part of concentrated acid to three parts of water. The sulphuric acid served to prevent the precipitation of bismuth oxychloride and the hydrochloric acid reduced the permanganic acid to a manganous salt. In a previous paper (*Journal of Ind. & Eng. Chem.* 8 p. 716, 1916), we have demonstrated that hydrochloric acid in low concentrations has no reducing action on the chromic acid. When this mixture had boiled 2 min., it was cooled by adding cracked ice and titrated electrometrically with ferrous ammonium sulphate and potassium dichromate on the apparatus described elsewhere by one of us in the same journal, 9 p. 780, 1917. These titrations can be carried out with nearly as much accuracy although with less convenience on the home-made apparatus described by Hildebrand and by Conant and the writer in the *Journal* of the American Chemical Society, 35 p. 869 (1913) and 38 p. 341 (1916), respectively.

The time required for a single determination is from 9 to 11 min., and two determinations can be made in from 10 to 14 min. If, as in most cases, only one addition of sodium bismuthate is made, the time necessary is somewhat shorter. The results are usually either correct or low but they are never low by more than 0.03 per cent. The method requires no filtering and the manipulations on the hot plate are so spaced as to time that the analyst has no need for haste in any of the operations.

For the determination of chromium in this class of material, we believe that the method is at once more rapid and more reliable than any method so far published. As stated at the beginning of this article, however, it is not available for forged steels or for those which have been extensively heat-treated. When vanadium is present this is also oxidized and titrated. A method soon to be published, however, describes a procedure by which the vanadium may be quickly determined and the correction applied. Other elements do not interfere.

*Research department, Nicetown plant, Midvale Steel & Ordnance Co., Philadelphia.

HEAT TREATING TOOL STEEL

Causes and Remedy for Hardening Cracks—Heating in Liquids Preferred

Contending that there is a great deal still to be learned about carbon tool steel and especially as to how it is affected by heat treatment before hardening, S. U. Brayshaw, Manchester, England, said, in a paper "The Heat Treatment of Tool Steel," presented before the Birmingham Metallurgical Society in March, that he did not think the final annealing or heat treatment of tool steel was yet properly understood. An account of his remarks is abstracted as follows from the London *Iron and Coal Trades Reviews*

Dealing with a research of his which was still in progress, Mr. Brayshaw mentioned that he had two large ingots cast specially, the analyses of which were remarkably close. It was satisfactory to find that Sheffield steelmakers could produce two large ingots so much alike. The analysis, representing a standard tool steel, was as follows: Carbon, 1.13; silicon, 0.14; manganese, 0.37; sulphur, 0.027; phosphorus, 0.022; chromium, 0.19; tungsten, 0.54 per cent. The chromium made little difference, and its presence was probably unintentional. The cooling curve showed a halt at 738 deg. C., and this was so consistent that they used the quenched steel to standardize their pyrometers. The point of recalescence on re-heating was usually about 716 deg., but depended upon the maximum temperature.

From this steel a large number of bars were made. In the physical tests a large variety of results was obtained when the hardening treatment varied while, with bars submitted to the same hardening treatment but to different previous heat treatment, the results were most irregular. This showed that the whole question had not been sufficiently investigated. It was desirable, if possible, to apply these results for the assistance of the practical hardener who had to deal with difficult tools which were liable to crack or to change shape in hardening. He had therefore made a large number of test cutters of designs which had been found to be specially liable to hardening cracks.

Hardening Cracks

Showing a group of such cutters after hardening, Mr. Brayshaw said that he had a regular system of naming these hardening cracks and assigning marks to them according to their inferiority. They wanted to find out how to make uniformly sound cutters, and he believed that they were on their way to that goal when they produced particular cracks and found out what regularly produced each kind of crack. He had a number of these cutters in various stages, and every cutter was being treated by a different process, while all were hardened as nearly alike as possible. For the first few hundred cutters he devoted a great deal of attention to the various hardening methods and temperatures, and with rising or falling heats or long soakings. He had the best success with the cutters which were raised just above the yield, then cooled to just above the recalescence point, and finally quenched in water. But he found that the best results in the avoidance of hardening cracks might be obtained by the suitable preparation of the steel before hardening.

Referring to a cutter of a design peculiarly liable to cracking, Mr. Brayshaw said that he had known something very remarkable to occur in connection with a cutter of that kind. They used to buy a great quantity of carbon steel, and when bars of 2½-in. diameter came in they used to make from them cutters of this design, harden them by a moderately severe process, and then observe the kind of cracks which ensued. In one case the cutter hardened without a crack when treated by the standard treatment he had referred to. That remarkable result he was convinced must have been due to the condition of the steel when it left the steelmakers. There was probably nothing remarkable in the analysis, but the steel might by pure chance have gone through a process which gave it very unusual properties.

The question might be asked what was the final treatment of such steels before they left the steelmaker. The maximum temperature might vary, and also the time the steel was subject to that temperature. The manner of annealing was also subject to great variation; the steel might be kept a little above or a little below the change-point in the cooling down. Each of the factors was variable to an indefinite extent, and by a combination of them they got an enormous variety of possible terms. If one purchased steel from a good maker one might rely upon a large degree of uniformity in analysis, Brinell hardness, and machinability. Yet in such steel there were great differences—of an elusive kind, but possibly of great importance. They ought to endeavor to discover a law which would enable the steelmaker to leave the steel in the required condition. Our knowledge of steel had been increased during the last dozen years, and yet we were only on the path of discovery.

Liquid or Atmospheric Heat Treatment

The lecturer said that his experience had shown him that to obtain the best results it would be necessary to carry out heat treatment in liquids instead of in atmospheric furnaces. It was not possible in the atmosphere to regulate the process with precision. During heating the temperature of the muffle must be higher than the temperature to which it was wished to raise the work. This involved the over-heating of sharp corners and thin parts, while some of the steel near the walls of the muffle would be baked or soaked before the protected parts became sufficiently heated. Metal might be heated by contact with the gas or smoke as well as by radiation. That had some advantages, but there was also an increased risk of over-heating corners and thin parts. In either case it was impossible to raise the temperature evenly, although the final heat might be uniform. The only way to aviod this was to raise the heat with a slowness that was seriously objectionable.

The only ideal method was to immerse the tools for a given length of time in a liquid which was maintained at the proper temperature. The pyrometer then showed truly the temperature of the work itself, as nothing in the bath could have a higher temperature than the liquid. The bath could not vary rapidly in temperature or be caused to fluctuate by the opening or closing of a door, and when the heat was withdrawn the mass cooled altogether. The changes in temperature must be comparatively slow. There was nothing to prevent such liquid being used for the heating of bars on a large scale, the process being the same as with small tools.

Speed of Heating

Heating in liquids is very swift, said the speaker. People working on accepted lines said that this was objectionable. One so often heard it said that the articles should be heated slowly that it was assumed that there must be some virtue in slow heating. But this was another case in which people were misled by an expression which led to confused thinking. There was a similar confusion when a man said that a tool was too hard, really meaning that it was too brittle. The hardness in nearly all such cases was a good thing. Even a punch would be much better if it could be got glass-hard, and at the same time be as tough as if it had been tempered. On the other hand, if a man said a steel hammer was too hard he was using a correct expression. Ordinarily when one said that steel must not be heated too quickly, what was really meant was that it must not be over-heated on the outside, which was the result of swift heating as ordinarily carried out. If over-heating of the surface could be avoided, there was no objection to swift heating, and this was possible with heating in a liquid. He had had tens of thousands of articles heated from the cold in salt baths, and he believed that the effect of the swift heating had been good. The best results had been attained with very short heats, five minutes total time instead of half-an-hour. With these swift heatings he had got high elastic limits. The swift heating of a hardened tool might crack it, so that there the warning against swift heating was not out of place.

How the Germans Destroyed Belgian Plants

Quantity Production Unlikely for Two Years — Permanently Eliminating a Strong Competitor Was the Calculation

PARIS, FRANCE, May 10—The destruction carried out in Belgium by German troops, acting on orders, is estimated at $44,000,000 on 1914 evaluations and $160,000,000 at present prices. The Germans have destroyed 32 blast furnaces out of a total of 52; 28 converters out of 50 have been wrecked; 63 rolling mills out of 96 have been broken up; 70,000 machine tools have been stolen or destroyed. As a consequence of this destruction, there are at the present time 700,000 men out of work in Belgium. This represents two million persons who must be provided for at a cost of $2,000,000 per week.

Practically all the destruction inflicted on Belgium has as its object the wrecking of the industry. When the German armies came through Belgium in 1914 their advance was so rapid that there was no time to destroy, and when the war developed into a state of siege, the whole of Belgium with the exception of the small portion around Furnes was well inside the German lines and thus protected against bombardment. In consequence of this, a superficial examination gives the impression that Belgium has suffered little in the war. The contrast between the war zone in France and the country in the interior of Belgium is striking.

How the Blowing Engine House Looked After the Armistice

But while the towns, cities and factories of Belgium have not been blown to bits by artillery, they have suffered terrible ravages at the hands of the invaders. For four and a half years the Germans have systematically bled Belgium. With very few exceptions the factories have been stripped of all they possessed, and, on an average, will be unable to produce any great quantity of goods in less than two years. If machines were left they were at least denuded of essential parts.

The worst feature of this situation is that everybody has suffered, and in consequence there are no factories in a position to help the others to get back to production. To give one particular instance, the whole of the automobile factories of Belgium have been stripped bare, the steel plants have been destroyed, the rolling mills are non-existent, and the only Belgian firm specializing in automobile frames was razed to the ground in the sack of Louvain. The most enterprising automobile firm in Belgium intends to get into production before the end of the year, but in order to do this it has been obliged to buy machine tools in England and America, to import frames from America, and to have its gears cut and heat treated in the United States. These conditions apply to the whole metal-working industry throughout Belgium.

All the Cast-Iron Cooling Floor Plates of the Homécourt Works Sheet Mill Had Been Removed

The Germans Had Not Finished Breaking Up the Sheet Mills But Left the Foundation Bolts of a 2500-Hp. Motor

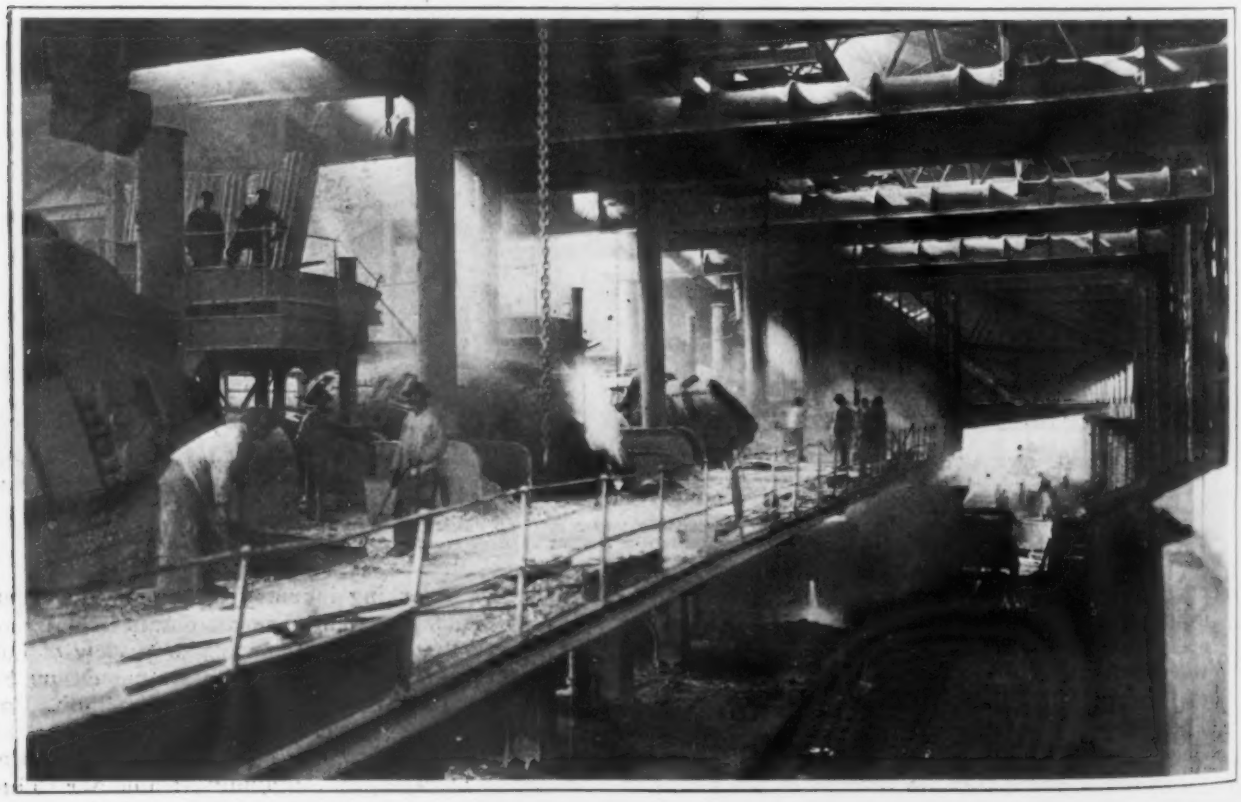
These and the views on the six succeeding pages are reproductions of photographs taken in the Homécourt Works of the Compagnie des Forges et Aciéries de la Marine et l'Homécourt

Blockaded, Germany had to obtain metal and machinery wherever she could, and in view of her military situation she can in a certain measure be excused for having made Belgium pay tribute. But this is not all. The terrible charge has to be brought against Germany of having systematically robbed and wrecked in Belgium with no other object in view than the destruction of the industrial power of that country and the removal of a competitor

The Roll Yard of the Homécourt Works in 1911, the Bessemer Steel Plant at the Right

from the world's markets. Literally thousands of cases could be cited to prove this contention, but one should suffice.

The system of requisitioning machinery varied throughout the war, and at certain times several organizations had charge of this work. It thus happened that there was often severe competition for particular machines. One such instance is related by the Cockerill company. A certain machine was reported on and photographed ten times, but owing to internal opposition nobody succeeded in getting possession of it. One morning an engineer arrived with a requisition order, a gang of soldiers, a locomotive and two freight cars. Within an hour he had the machine loaded on the freight cars and had pulled away with it. A very short time afterwards another person arrived with a properly signed order for the same machine. Finding it gone, he rushed to the railroad station and endeavored to stop it. The two cars had gone, however, and neither the Belgians nor the Germans were able to discover who held possession of it.

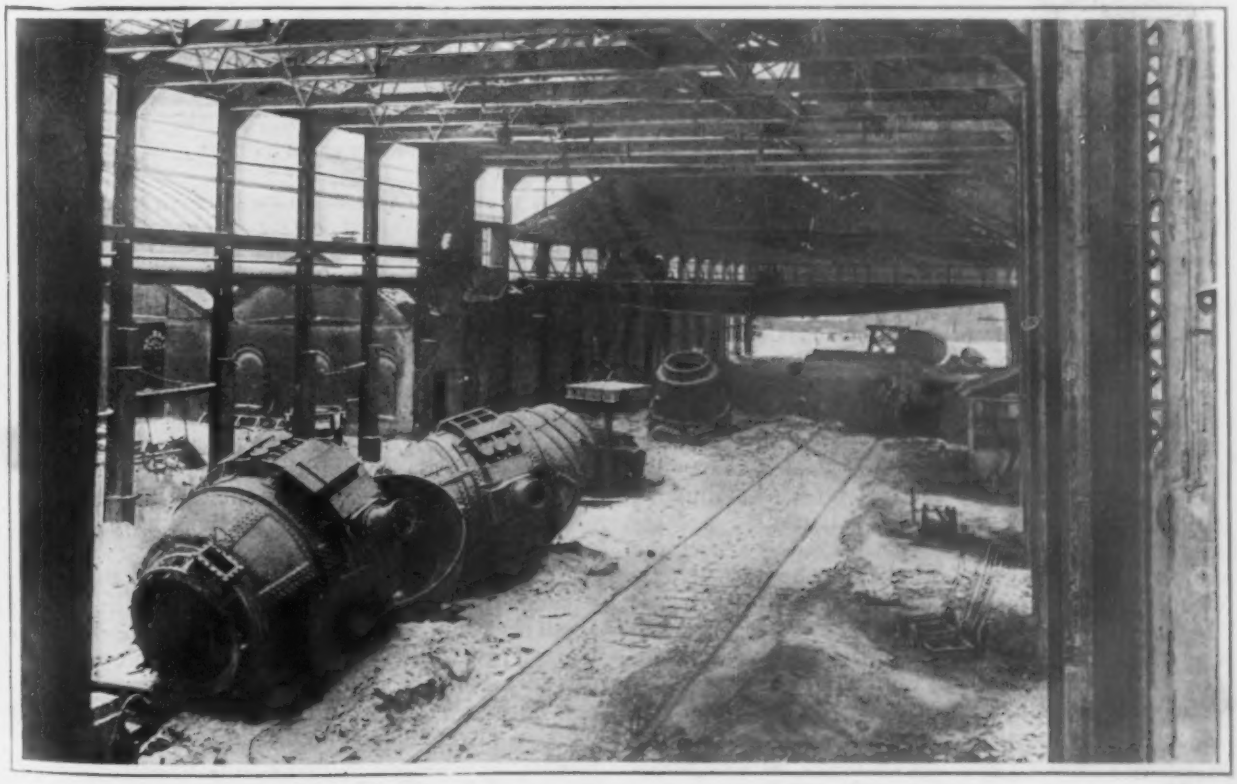


The Bessemer Plant of the Homécourt Works in 1911, Showing the Track for the Ladle and the Feet of the Columns Carrying the Converters and Working Platform

In 1919 the Roll Yard Shown in the View Opposite Looked Like This, the Rolls Having Been Carried Away

The seizure of individual machines went on in this way at the Cockerill factory from 1915 until May 25, 1918. Up to this time it was possible, by entreaty and argument, to induce the Germans to respect those machines which were absolutely indispensable to a resumption of business after the war. But on May 25 the factory was visited by the terrible organization known as the R. O. H. M. A. Under a polished exterior, this was one of the most barbarous instruments of destruction ever let loose on an industrial organization. In the Liège district the head of the R. O. H. M. A. was Von Dip. Ing. C. Quasebart, professor of metallurgy at the German University of Aix-la-Chapelle. With excuses and regrets, Dr. Von Quasebart explained that the German army needed guns and shells and was obliged to seize a certain amount of metal, but this seizure would be made so as to occasion as little loss as possible. Then his wrecking gangs were set to work with orders to secure the required metal and inflict as much damage as possible.

Some of the officers were franker than Von



When Visited After the Armistice the Working Platform and Appurtenances Had Disappeared and the Converters Alone Remained in Course of Demolition on the Ground

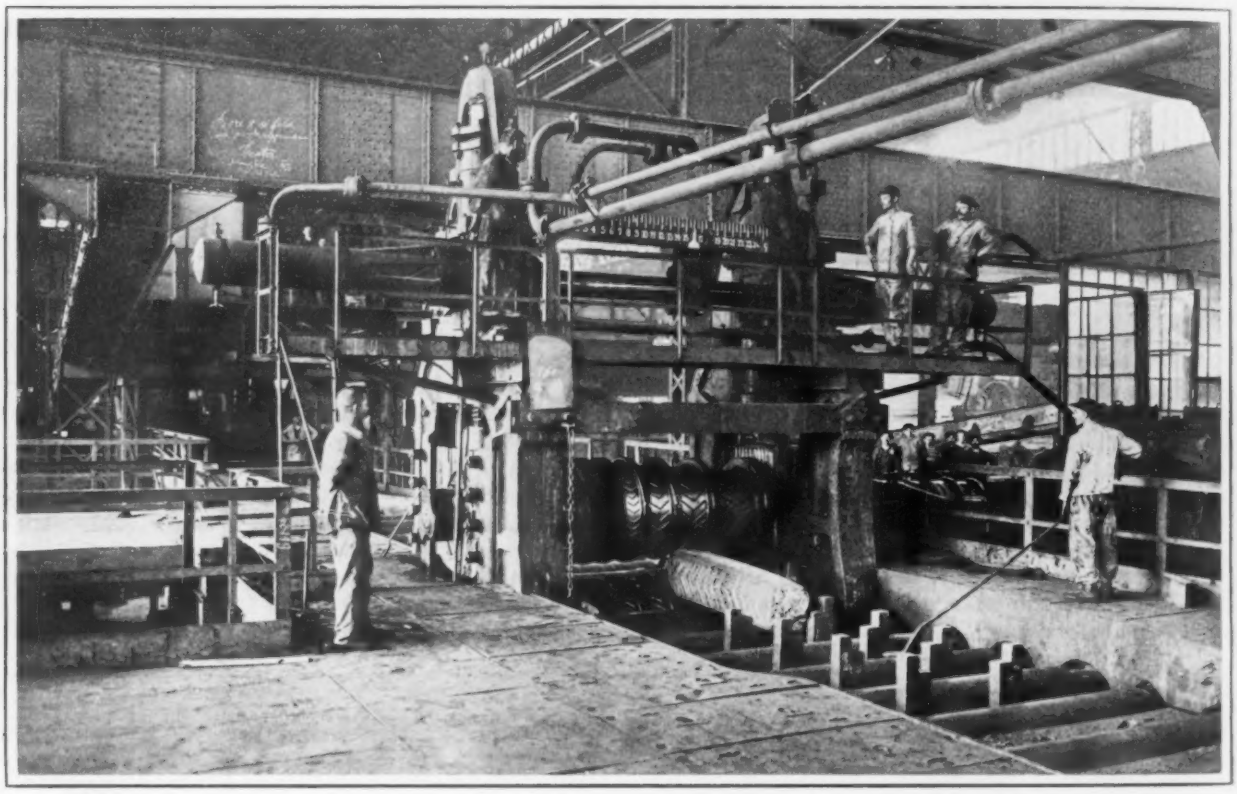
Quasebart. In May Germany had launched her great offensives, with no small initial success. It was explained to some of the Cockerill directors that Germany could not fail to win, and as, in consequence, no indemnity would have to be paid to Belgium, they could destroy without any fear of the after results.

The usual method of working was to start at one end of a building, cut the holding down bolts of the different machines, hitch the overhead travelling crane to the machine, carry it to one end of building, then drop it from a sufficient height to break it. In some cases other organizations had come along and taken the overhead cranes away, with the result that the work of the wrecking gangs was so seriously interfered with that a general order was issued forbidding the removal of cranes. If more than one crane existed in a building, the most powerful had to be left. The scrap created by these wrecking gangs was collected into freight cars and sent into Germany.

From May 25 to 10.45 a.m. of Nov. 11—fifteen minutes before the Armistice went into effect—the R. O. H. M. A. gangs transformed Cockerill machinery into scrap. Nothing was respected. If they wanted fire bricks, they pulled down an entire furnace; if a valuable piece of machinery had a desirable cast iron base, they destroyed the entire machine to get the base; if they wanted steel, they would cut through the vertical pillars holding the building and cause its entire collapse. Scores of these columns, cut through with an acetylene torch one foot from the ground, indicate where shops once stood. Another method of destruction was to cut the holding-down bolts, hitch a locomotive crane to the desired machine, then pull it through the window. If the opening was not big enough at the outset, it soon increased to the desired size. In other cases dynamite was made use of to destroy machinery which could not be lifted up and which could not be dragged through the window.

There was naturally no attempt at economy in this destructive work. The gangs would start on one building with the object of getting cast iron and would seize upon the machines which gave the greatest amount of this metal. Another gang would have orders to get steel, but instead of working on the partially destroyed building, they would start in an entirely new place. On the morning of Nov. 11 the wrecking gangs started on the work of cutting through the plates of the blast furnaces, although it was obvious that they could not even finish their cut before the armistice would go into effect.

All the locomotives and the locomotive cranes, some 30 or 40 in number, were taken away at the beginning of the war. All of the rolling mills have been destroyed; all the furnaces have been pulled down; not a single drop hammer remains; all the hardening ovens have gone; all the smaller machinery, such as lathes and automatics, have gone into Germany; the sheet metal shop is empty of everything but some abandoned German war material. Everywhere there is destruction and desolation.



Blooming Mill No. 2 of the Homécourt Works As It Was Photographed in 1911

A certain number of big gas engine cylinders have been left behind, for no easy means of breaking them were available. A small amount of machinery, although labelled for destruction, had not been reached by the wrecking gangs, and this has been united into one of the shops and started up with electric power from an outside force, for the Cockerill electric generating stations have all been destroyed.

The object of the German forces was to remove a competitor by destroying the Cockerill factory. In all the countries surrounding Germany—Holland, Norway, Sweden, Denmark, Russia—the two greatest furnishers of railroad material were Belgium and Germany. Between these two the keenest competition prevailed. France, England and America were comparatively unimportant competitors for this market. The German argument was that by systematically destroying such firms as Cockerill

they would secure for themselves the free run of the markets from which the Allies could not exclude them, whatever the peace conditions.

Cockerill has been described merely as an example of the general destruction throughout Belgium. Only a few hundred yards away the Ougrée-Marihaye factory, which was the rival of Cockerill, and employed 9000 workpeople, has been destroyed in the same thorough manner. Right along the Meuse valley, from Liège to Huy, a distance of 25 miles, there is not a single engineering establishment but has been stripped of all it ever possessed. Ougrée-Marihaye has lost machinery and plant to the value of $11,000,000 on 1914 estimates, and requires $30,000,000 to put the factory back to pre-war condition. The Fabrique Nationale factory at Herstal, near Liège, was robbed of 3600 machine tools out of a total of 3800. All pipes, pulled out the boiler, and sawed through all the tubes.

Although not a big factory, compared with some of the others, Derihon was important to the automobile industry owing to the fact that he was a specialist in forgings and in the heat treatment of steels. With this plant wiped out of existence the whole of the automobile factories dependent on it will have greater difficulty in getting back to production.

The condition of the Belgian metal industry could not be more eloquently set forth than in the following official figures showing the production for 1913 and 1917:

	Tons in 1913	Tons in 1917
Iron for the production of steel	2,324,490	7,990
Steel billets	2,192,180	1,440
Zinc	204,220	10,290
Zinc, sheet	51,490	1,675
Lead	103,480	22,745

Corresponding to the Opposite View and Indicating the Extent of the Destruction Is This Photograph of 1919

the electric power installation was taken away, but the electric lighting equipment was allowed to remain, for the German army had need of it. The loss here is $6,000,000 on 1914 evaluation. The F. N. company specialized in rifles and small arms, but also had a rather important output of automobiles, motorcycles and bicycles.

The Bruges steel works have been destroyed more savagely than the others. The German armies abandoned these works before the armistice came into effect, but before doing so they smashed everything. Even the yard locomotives were smashed and the rails torn up. This was not done to get metal, for the broken machines were left behind.

All the essential portions of the Derihon forges at Loncin, near Liège, were removed to the Rhein-Elbe Gelsenkirschner A. G. Abt. Aachner Hütten-Verein, at Düsseldorf. The firm sent their own engineers to superintend the removal of the plant; they insisted on all drawings being given up, for it was their intention to erect the Derihon plant in Germany. When this company had taken all it required another official organization came along and seized the remainder for scrap. They did not need the steam engine, so they broke all the steam

German destruction has not been confined to the engineering trades, but has been extended to the horse-breeding industry. One has its effect on the other, for with mechanical transportation destroyed relief might have been found in animal traction—if the Germans had not been attentive. Now that the horses have been reduced in number it is necessary to turn to trucks and tractors, which do not exist, and cannot be manufactured in Belgium. Thus will a new industry profit from German acts.

As it is quicker to replace machinery than horses, the action of the German invaders will have the result of turning Belgium toward the agricultural tractor, which was entirely unknown before the war, and also to the automobile truck, which in normal times could not compete with rail and horse transportation.

The internal railroads of Belgium have not suffered any destruction, for the simple reason that they were required by the German army. All the lines from France to Belgium, however, have been entirely destroyed. At the present time there are two train services per day from Paris to Brussels, but instead of occupying only a little more than 4 hr. the journey cannot be accomplished in less

than 10 hr. For the first 35 miles out of Paris the railroad line is in normal condition; for the next 120 miles the entire railroad has been destroyed. The whole of the permanent way between the two capitals will have to be rebuilt. The need for railroad material is enormous. W. F. BRADLEY.

Experiences in the Cockerill Works, Seraing, Belgium

Leon Greiner Emphasizes Need of Continued Help of Allies in Rehabilitating Business

THE Belgian iron and steel industry during the German occupation was made the subject of a paper read before the Iron and Steel Institute in London in May, by Leon Greiner, director-general Société John Cockerill, Seraing, Belgium. From it the following has been taken:

On Aug. 1, 1914, our country possessed 68 furnaces, of which 49 were in blast; their total capacity approximated to 265,000 tons of pig iron per month. On Armistice Day there remained but four intact, representing 6.3 per cent of the total productive capacity. Within a future which is uncertain, perhaps within a year, 25 others, amounting to 44 per cent of the former capacity, may be put into a fit condition to be blown in. So much for the blast furnaces, the sources of all industrial activity in the iron and steel trades.

Side by side with the technical aspects is the important financial question. Will it not be necessary to sink capital in plant, the cost of which is three times higher now than it was in 1914? How shall we be able, later on, to struggle against competitors whose capital commitments are three times less to discharge, or who have been able almost completely to write off the cost of their plant out of the profits they have made during the war? And when industry is re-established, shall not we, who depend on our export trade, find the world's markets occupied by the industries which have developed considerably abroad during the war? The task before Belgium is vague, and we shall not be able to fulfill it without the help of those who, allied with us in the armed struggle, will, I doubt not, be side by side with us in the peace struggle for world trade.

The Homécourt Roll Shop in 1911

Most of the rolling mills have been destroyed by dynamite. Many of the blowing engines have suffered the same fate. At the works of the Cockerill company nine rolling mills have disappeared by these means out of eleven, and only three blowing engines remain out of twelve. The same conditions obtain at the works of Ougree-Marihaye and at La Providence, and even more desolate are La Louvière works, which belonged to the big owner, Pol Boel.

Taking it all together, the havoc in the great iron and steel works (taking into consideration only those works which possessed blast furnaces) is estimated at a purely approximate sum of 210 millions of francs ($40,500,000). This amount, based on prices as they existed in 1914, is only the bare cost of the plant destroyed, without taking into consideration any indirect expenses of any kind.

This, then, is the situation. The problems to be solved are numerous.

The industrial output of the country during 1915 was extremely low. The production of iron was 68,150 tons, that of steel 110,180 tons, and finished rolled products 164,370 tons, which will be seen to be pretty reduced proportions, being only 2.75 per cent of the pre-war pig iron output, and 4.22 per cent of the pre-war steel production.

Toward 1916 the Belgian rolling mills began to use a considerable proportion of crop ends, and the production of the iron and steel works can be given as follows: Pig iron, 127,825 tons; steel, 137,590 tons; rolled products, 223,335 tons; or 5.14 per cent of the pre-war pig iron production and 5.29 per cent of the pre-war steel production.

How Manganese Was Conserved

At the Cockerill Works the Germans divided our stock of rich manganese ore into two portions—560 tons which they carried off, and 60 tons which they gener-

ously left us. How they were deceived! It was not 60 tons but 1150 tons that we were able to hide from them, at the risk of our liberty, and to transform secretly, partly into spiegel, in the blast furnace, and partly into ferromanganese, in the electric furnace. On the other hand, the scarcity of coal for the producers compelled us, as shown by the note on the subject sent by your late president, Adolphe Greiner, to the May meeting 1915, to attempt and subsequently to develop the utilization of pitch as a fuel for the open-hearth furnaces. Special furnaces were constructed with this object, which allowed of our making open-hearth steel of most varied qualities, from sheets for brewery and sugar works vats to tramway sleepers.

The stocks of manganese ore were not, however, inexhaustible, and the war was protracted beyond anything that could have been foreseen. From the end of 1915 and in order to preserve the last few tons of ore for the manufacture of ferromanganese, we succeeded in recovering the manganese contained in the material found in heaps on the slag tip, slags derived from old acid Bessemer converters. The average analyses of these slags, of which 15,500 tons were recovered by hand picking, was as follows: Iron (about), 10 per cent; manganese, 10 per cent; lime, 1.50 per cent; silica, 55 per cent.

This was the ray of light by which we were enabled to keep things going a bit; the recovery of the manganese by increasingly efficient means allowed of our manufacturing in the only blast furnace in activity, and starting with this apparently intractable material: basic pig iron containing 1.5 per cent of manganese; then open-hearth pig with 4 per cent of manganese; then spiegels of varied composition ranging up to 16 per cent of manganese, and finally, rich spiegel containing up to 30 per cent of manganese. The latter, whose manufacture involved a burden consisting only of acid slag, lime and coke (giving rise to a production of 10 tons of slag per ton of coke) was practically free from phosphorus, and replaced ferromanganese.

Later on this special pig iron became scarce and had to be economized; tests were made in order to replace a portion of the manganese additions by carbide of calcium made in our electric furnace. These experiments taught us that with a little care it was possible considerably to reduce the manganese additions, in fact we succeeded in working during a campaign of a fortnight by only using 3.25 kg. (7.15 lb.) of metallic manganese per ton of ingots made in the Bessemer converters, besides a little aluminum which was added in the molds.

Still later, when only the open-hearth furnace was being used—and for a sadly reduced output—and the ferrosilicon had been exhausted, the electric furnace was able, similarly, to undertake the manufacture of this alloy.

We had the satisfaction of using up our very considerable stocks, and in addition large amounts of other materials that it was necessary to save from being requisitioned, namely 1000 tons of rolls, 650 tons of ingot molds, and 1450 tons of special steels for springs. The barrels of rifles, nickel and chrome steels and other finished products, of the existence of which the Germans knew nothing, were thus sacrified.

How the Destruction Was Organized

In the end, however, everything was lacking; raw materials, fuel, refractories, good luck no longer sufficed; the working shifts became ever shorter and fewer, and finally all activity in our works died down. It was then that the systematic destruction of our plant reached its full development.

The destruction of the Belgian works, under the form of requisitions, was the object of a regular organization on the part of Germany. Both civilians and the militry applied themselves zealously thereto, according to a well-established plan, and special departments were created with this object. Two leading organizations shared in the too facile task: Die Materialbeschaffungstelle and Die Maschinenbeschaffungstelle. The requisition was always based on the terms of one or other of the decrees (there were so many of them!) published by the German military government. The military officials of the different organizations promenaded the works to take note of whatever might suit their purposes. The Materialbeschaffungstelle undertook the search for material required directly at the front and supplies intended for military works in the occupied regions. It was this organization likewise that, by means of the "Rohstoffverwaltung," carried off the high-speed steel for tools and copper of every description.

The Maschinenbeschaffungstelle was only the instrument of a powerful limited company, the Wumba, in

The Roll Shop in 1919, Made a Storehouse

Berlin (Waffen und Munitions Beschaffungs Amt), a civil association directly under the control of the ministry of war. It was to the Wumba that the German works addressed their requests for materials (tools, machines, buildings, overhead traveling cranes, etc.); with the Wumba that they discussed prices, and to the Wumba that they paid for their "purchases." We have seen the directors of large works—colleagues before the war—parading our workshops and steelworks, making their selections as though at a sale, measuring things up calmly and even arguing among themselves as to the possession of such and such a machine, just as they would have done had the material really been at their disposition.

The Germans attempted at the commencement to adopt the method of immediate payment of these requisitions; the refusal to enter into negotiations or to lend a hand to any industrial operations whatever was as unanimous as the refusal to work friendly, and later on even the authorities ceased to endeavor to carry this out. The formula was in many cases extremely attractive—for the buyer: payment of the invoiced price, with a deduction of 10 per cent in the value per year of service for the depreciation of machinery, to the credit of an account lodged in Germany. It may be asked whether, in the case of an old machine of more than ten years' service being carried off, we should have had to have paid a certain percentage, in recognition of the "service" which was being rendered to us by relieving us of machinery which, despite its age, was still capable of giving valuable service!

An important victim of the Maschinenbeschaffunstelle was the new blast furnace gas electro generative group of 10,000 indicated horsepower which the Cockerill company was about to put in operation in its large central power house at the moment when war was declared.

On Dec. 1, 1917, and quite suddenly, a commission, partly civil and partly military, came to take possession of the engines, access to which was forbidden to the staff of the works itself. The dismantling was commenced by an inexperienced gang, who endeavored to remove the immense collector of the continuous current dynamo blade by blade by means of chisels and of wrenches. Later on a German engineering specialist presided over the work, which lasted for twenty months. After the motor it was the turn of two overhead traveling cranes of 40 tons capacity, and the hall of 115-ft. span which had been specially built to shelter the largest gas engine in the world. The technical difficulties which had to be surmounted were not little, the driving shaft with its cranks and armature cross head alone weighing no less than 130 tons.

Still Erecting Belgian Apparatus in Germany

The whole of these appliances are actually in course of being set up at the Kraft Ironworks (Abteilung Niederrheinische Huette at Duisburg). I say advisedly in course of being set up, for although the armistice has been signed for the past six months it would appear that the work is with strange inconsistency still continuing.

The German demolishers put the period of their stay in our works to profit. They used the interior of the huge columns and the girders of the overhead cranes as hiding places for supplies of the most varying description, introduced into Germany by fraud and stolen from goodness only knows where—ham, antimony, lead, butter, bottles of wine, copper and high-speed steel, keeping one another company behind the shelter of the steel plates, which were carefully riveted up afresh after the introduction of their compromising contents. A single girder from a workshop 100 ft. in height, and intended for the hardening of big guns, had concealed in its interior 700 bottles of wine and 2200 lb. of white metal.

The facts demonstrate conclusively that if the recovery of raw material was the avowed object of the organization this object was none the less often only a pretext. Why should the most vital parts of our plant have been selected for destruction? Why should not, for instance, a single plant have been destroyed entirely for the recovery of the maximum of its materials instead of simply being mutilated and stripped of whatever was easiest to remove? It is perfectly certain that one of the chief objects pursued was to suppress future embarrassing competition.

Will Build Large Automobile Plant

DETROIT, June 2.—Speculation as to the plans of C. Harold Wills and John R. Lee, until recently executives of the Ford Motor Co., was settled last week by the announcement that a large plant to manufacture automobiles of Mr. Wills' design would be erected immediately on 3000 acres just south of Port Huron. Details of neither the car or the plant were given out. The two men have backing of the highest order.

The land obtained fronts three miles on the St. Clair River, four miles on the Town Line road and has a depth of a mile and a half. It will be served by railroads and lake boats. It is expected ultimately to make a new industrial community with the proposed plant as the center.

Railroad Boiler Makers Meet

The eleventh annual convention of the Master Boiler Makers' Association was held at the Hotel Sherman, Chicago, May 26 to 29, inclusive. The sessions were devoted to a large number of committee reports on various features of the design, construction, repair and operation of boilers. The registration totaled 745 and the new members enrolled at the meeting numbered 200.

The officers elected for the coming year are: President, John B. Tate, foreman boiler maker Pennsylvania Railroad, Altoona, Pa.; first vice-president, Charles P. Patrick, general foreman boiler maker Erie Railroad, Cleveland; second vice-president, Thomas Lewis, general boiler inspector, Lehigh Valley Railroad, Sayre, Pa.; third vice-president, T. P. Madden, general boiler inspector, Missouri Pacific Railroad, Dubuque, Iowa; fifth vice-president, Frank Gray, general boiler foreman, Chicago & Alton, Bloomington, Ill.; secretary, Harry D. Vought, 95 Liberty Street, New York; treasurer, W. H. Laughridge, general foreman boiler maker, Hocking Valley Railroad, Columbus, Ohio.

In connection with the convention the Boiler Makers' Supply Men's Association held an exhibit, in which about 46 constituent companies displayed their products. The supply men elected the following officers for the coming year: President, Chas. B. Moore, Oxweld Railroad Service Co., Chicago; vice-president, Frank J. O'Brien, Globe Seamless Steel Tubes Co., Milwaukee, Wis.; secretary-treasurer, George Slate, The Boiler Maker, New York.

Thompson Properties to Be Sold

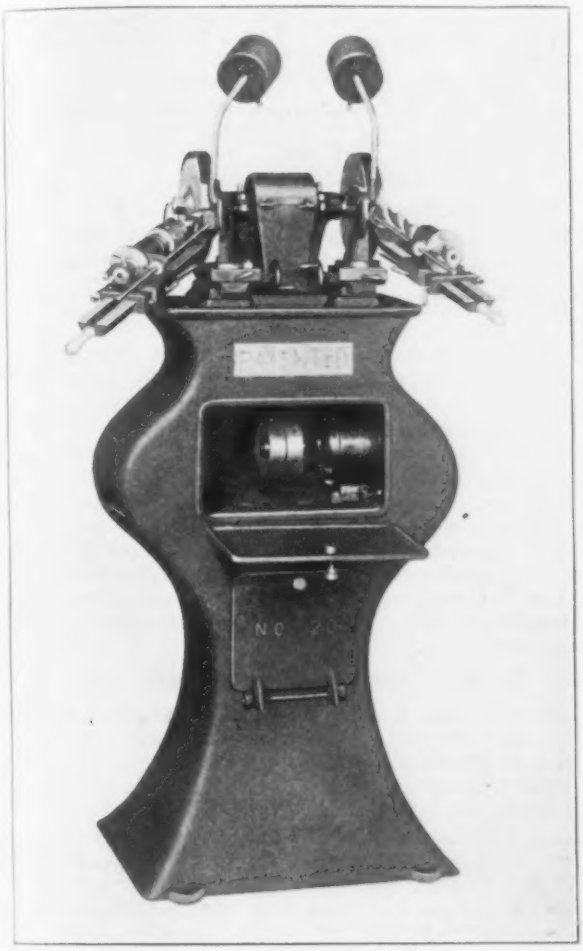
UNIONTOWN, PA., June 2.—Although negotiations are now suspended until a technicality is disposed of, there seems to be every indication that the vast estate of J. V. Thompson, having a valuation variously estimated from $50,000,000 to $75,000,000, is about to be sold. Trustees in bankruptcy with members of the J. V. Thompson creditors' committee have been in conference with the attorneys of the prospective purchasers for a week and are now scheduled to meet early this week and sign the final papers. No intimation has been made officially as to the identity of the purchaser, but it is generally assumed that a steel company will be the ultimate purchaser, although it may not figure in the deal at this time.

With a capital of $50,000 the Victor Steel Co., Warren, Ohio, has been incorporated under the laws of Ohio. J. E. Lavine is president, Leo Alexander is secretary and treasurer and R. A. Mason is vice-president and general manager. The company will buy and sell the by-products of the local steel mills.

Grinder for Drills

A drill grinder that is automatic in the actual grinding of the drill lip has been placed on the market by the Bellevue Industrial Furnace Co., Detroit. The drill is placed in a carriage which is brought forward to a gage which indicates the correct grinding position. This gage is on a spring so that it automatically snaps out of position and cannot touch the wheel when grinding is begun.

When the drill is in the proper grinding position



Machine for Automatic Grinding of Drill Lips. The drill is clamped in the carriage which is moved up and down by hand at the same time the drill is being rotated a quarter turn by gears. Two carriages provide for right and left grinding

it locks in place, and a vertical movement of the drill holder moves the drill up and down against the circumference of the wheel, at the same time rotating it a quarter turn by gears, thus to grind the lip round. When one lip is ground a lever movement turns the drill holder to grind the next lip where it again locks in position. The machine can be indexed to handle drills with two, three, four or five lips, and it is stated, will sharpen three drills per min. The carriage is counterbalanced.

The grinder is made in twin form with two carriages and two grinding wheels mounted on a single base, so that either right or left hand drills can be ground. It takes taper shank drills or reamers in a spindle, and straight shank drills or reamers by chucking.

The work is ground on the circumference of the wheel instead of on the flat side, thus to obtain longer life from the wheel. When the wheel needs trueing, a diamond or other sharpening tool is placed in the chuck and brought forward to the gage, as is a drill for grinding, and the carriage is then operated across the circumference of the wheel by a cross feed. The machine is driven by an electric motor contained in the pedestal, and is equipped with two pulleys so that two speeds are available.

Electrically Heated Crucibles for Melting

A practical method of electrically heating crucibles which, it is believed, will appeal to many brass founders who may desire to retain their crucible furnaces, has been perfected in England. The Morgan Crucible Co., Ltd., after an extended series of experiments, announces such a system applicable to crucibles capable of melting up to 200 lb. The crucible itself constitutes the resisting element; the electrodes, which are water-cooled, are fitted at the top and the bottom of the crucible, which is thus heated by the passage of the current through it, the maximum temperature being developed precisely where it is required. Provision is made for the expansion and contraction of the electrodes, while the crucible is formed to give the advantages of a tilting furnace.

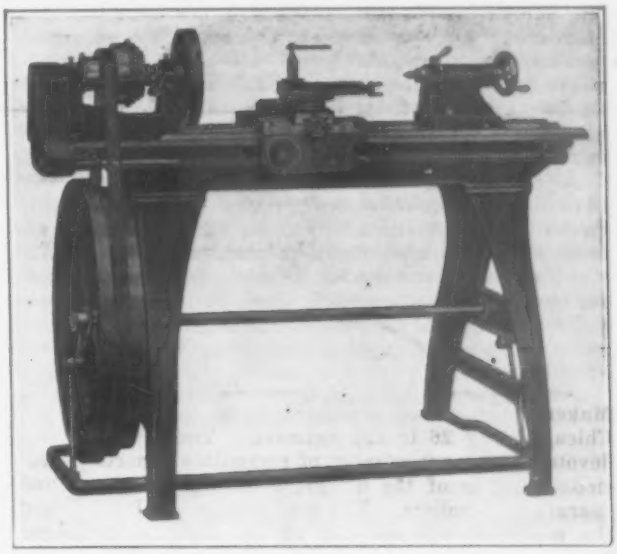
Record of the Lincoln Motor Co.

Describing its war work, the Lincoln Motor Co., Detroit, which was organized to manufacture airplane motors for the Government during the war and which is shortly expected to announce the manufacture of a new automobile, has issued a booklet describing its work. A synopsis shows that the company: Obtained the first Liberty motor contract awarded by the Government; financed the undertaking; remodeled one factory, but then built and equipped a complete new manufacturing plant, involving a total investment of about $8,000,000; built up within 12 months an organization of 6000 men and women; produced 2000 Liberty motors within one year after the company was formed and completed its final contract with the Government 16 days ahead of schedule.

The company is headed by Henry M. Leland and Wilfred C. Leland, formerly head of the Cadillac Motor Car Co.

Foot Power Lathe

A back-geared screw lathe operated by foot power is announced by the Shepard Lathe Co., Cincinnati. In this machine a planetary system of speed reduction replaces the usual back gears. The system permits the spindle to be thrown in direct or back gear without stopping the spindle rotation, by shifting a clutch. A



A Planetary System of Speed Reduction on This Foot Power Lathe Permits the Spindle to Be Thrown in Direct or Back Gear Without Stopping the Spindle Rotation

third or neutral position of the clutch enables the operator to start and stop the lathe. The tail stock is of the off-set type with set-over for turning tapers. A bar foot treadle enables the operator to drive the lathe from any point along the bed length. The swing over the bed is 11¼ in. and net weight 500 lb.

Transfer and Promotion of Employees

Classifying Capabilities and Characteristics of Workmen in a Manner that Creates a Known Reserve when Changes Become Necessary

THE transfer and promotion committee of the Chicago council of the National Employment Managers' Association has prepared a report which surveys the considerations involved in transferring and promoting employees. The chairman of the committee is H. C. Hobart, employment manager Albaugh-Dover Co., Chicago, manufacturer of cut gears and cream separators.

At the outset the committee makes clear its conception of the meaning of "transfer" and "promotion" by giving these definitions:

Transfer.—The placing of an employee elsewhere at work not requiring a higher degree of skill than his former job.

Promotion.—The placing of an employee elsewhere at work requiring a higher degree of skill than his former job.

A change in wage rate need not necessarily be involved in either case. Monetary reward for better work would be classed merely as a wage increase.

The report continues:

Classification and Analysis of Positions

The only scientific basis for the transfer and promotion of employees is absolute knowledge regarding every position in the organization, the positions from which a man may be taken to fill a given position and the position to which a given position may lead. In addition to this information there must be a definite knowledge of the physical and temperamental characteristics required in a person who is to fill a given position. Separating these two ideas, there must be a standardization of duties, a classification of positions, and a standardization of requirements, a job analysis. The first of these subjects is to be considered somewhat in detail by this committee, but the subject of job analysis will be considered only incidentally as it is a subject sufficiently broad in itself for a separate committee.

The first step in the classification of positions is that in which all positions having identical or very similar duties requiring the same degree and kind of skill, special knowledge, or responsibility are given the same name or classification title and are grouped together in one grade.

The grades having been established are then grouped into two classes, grades having certain characteristics in common being assigned to the same class. For example, all grades of bench workers may be grouped in one class, all grades the duties of which involve the operation of a machine are grouped in another class, etc. In some instances it will be found advisable to group the grades within classes into ranks. Where this is not advisable the grades of positions in each class may be separated into groups which indicate the degree of skill or special knowledge required to enter the grades. The grouping in a class of machine operators will illustrate.

Grouping of Machine Operators

Class C.—Machine operators.

Group 1. To include all grades of machine operators to which unskilled labor may be appointed.

Group 2. To include all grades of machine operators requiring some degree of mechanical skill but no previous experience in a distinct line of mechanical operation or on a special make of machine.

Group 3. To include all grades of machine operators which require skill in a distinct line of mechanical operation or on a special make of machine.

The purpose is still further served by listing after each grade the grades from which and the grades to which promotion or transfer may be made. The following illustration from one of the grades in the above class, group 2, will make this clear.

Grade.—Hand milling machine operators.

Grades from which transfer or promotion may be made.
Crater.
Skimmer assembler.

Grades to which promotion or transfer may be made.
Junior lathe operator.
Plain milling machine operator.
Universal milling machine operator.

In addition to affording a basis for a definite and equitable promotion system, such classification will afford basis for a complete job analysis, a basis for the formation of a scientific wage schedule, and will afford a uniform nomenclature for all employment reports, records, etc.

This classification should be made by the employment department with the assistance of the department heads of the organization. A complete copy of the classification should be kept in the employment department and kept up to date by them. The individual department heads should have a copy of such classifications and grades as pertain to their departments and all promotions and transfers should be made according to this classification. If the deviations from this rule are few, the employees will soon recognize that promotion follows a definite line and competition for positions ahead will awaken and it will be easier to hold employees.

Acquiring and Maintaining Eligible List

All transfers should be made through the employment department. A foreman or department who wishes to obtain a particular worker from another department should make application for this change to the employment department, which will arrange for the transfer if it is possible. Difficulty has been experienced in some organizations where department heads have thoughtlessly gone directly to the workers in other departments, offering them positions in their own departments, this stirring up general dissatisfaction. No position in an organization should be filled from the outside, as a general rule, if it is possible to fill the place by promotion from within the ranks.

To properly take care of promotion and transfer in a large organization, it is advisable to have an up-to-date list of eligibles for every position. This list may take the form of a card index, a loose leaf folder or a modification of the system used by the Government at cantonments. One firm has adapted this system to its use very readily. The record card and application of each employee, together with other information, are filed in a letter size manila envelope. The top of this envelope is divided into thirty-five or so spaces, each position representing an occupation in the company's shop. Each such space representing an occupation in which that particular employee has had experience is marked on the edge of the envelope with a V-shaped punch mark. When the envelopes of all the employees are standing upright in their file all punch marks in any particular horizontal line down the file indicate employees with experience in some one line of work.

When any position is vacant it is only a matter of a few moments to pick out the employment records of men with the necessary training or experience to fill the open position, and it is the duty of the employment department to select the candidate best fitted for the new position.

How Changes Are Made

Most common among the reasons which lead to the changing of employees from one position to another is

the necessity for filling a vacancy, in fact, the other reasons grow out of this one. Usually in filling a vacancy the object is solely to obtain the best man for the place, but it may be possible at the same time to fill the vacancy, and in so doing reward an employee for past services by promoting him to the open position. Or, if the position is a minor one, it may be possible to place in it a man who for reasons must be relieved from physical strain, or who does not properly fit in elsewhere in the organization. Certain positions which are so-called "blind alley" jobs may even be periodically rotated to relieve the monotony of the work.

Just which of the above circumstances shall fit each case can usually be determined by the employment manager after consideration of the positions in the organization which are known as feeder positions. As mentioned before, in the work of classifying all positions in an organization, each job is listed with the positions to which transfer and promotion may be made, and all positions from which transfer may be made. With such a classification at hand it is possible to obtain a list of all eligibles for the vacancy and determine the individual merits of each applicant.

Importance of Individual Records

Considering the shop employee, we find that most employers weigh first the length of service, that is, seniority. Not that this is necessarily the determining factor, but other things being equal, the man longest in the organization is entitled to first choice. Closely allied to this question of seniority is that of attendance. Employers are just beginning to deal with the question of absenteeism and tardiness, and these two matters should enter into every question of promotion.

In the case of a shop man, his record of work spoiled and his bonus earnings are excellent indications of his ability as a workman, while his character, temperament and attitude in the shop may be noted if department foremen are required to submit to the employment department from time to time, written reports on individual workmen. Many firms are requiring such reports periodically, and the material thus gained is exceedingly valuable in judging of a man's fitness for a different position within the organization. Physical and temperamental characteristics of any candidate may also be noted and passed upon by the employment manager after personal observation of the man.

The size of the company and the number of employees largely control the basis upon which transfer or promotions are made. A concern small enough so that the employment executive has an opportunity to be in personal contact with each and every employee may depend largely upon the judgment of this executive, who co-operates closely with the department heads, to make a proper selection by employing a large element of good "horse sense." A large concern should install a thorough system of mental tests, efficiency records and reports from department heads covering the strength or weakness of the employees under them.

Great care should always be taken that a deserved promotion should not be delayed longer than is absolutely necessary. If a promise of promotion or advance in pay is made this promise should be strictly adhered to and conscientiously kept.

Periodic Revision of Pay-roll

In the definition of the terms transfer and promotion mention was made that a change in wage rate need not necessarily be involved in either case. There are many men who are satisfied to work year in and year out at the same work, provided only that their wages are increased from time to time. In some companies it is customary to place new men on probation for a period varying from one to six weeks, during which their wages are nominal and at the end of that period a readjustment is made or they are placed upon a piecework basis. It is almost impossible to hire a new man and set a rate in justice to the man and to the company, until after the man has worked for a short time at least, especially if the position is one requiring some degree of skill. This would not be true of unskilled work nor to such an extent in semi-skilled work where a probation period might be unnecessary. For employees who have been with the company for a long period of time there is often no definite means provided for granting wage increases, only the men who make a "kick" being granted the increases, and often men doing similar work in different departments are paid widely different rates. Such conditions may be avoided by periodic payroll revisions, which provide for regular reviews of the entire payroll to secure increases for all deserving employees and to eliminate difference in rates for similar work in different departments.

Winning Support from Department Heads

While there is a great deal of work to be done in the preparation of information, records, job analysis, etc., prior to the installation of a proper system of transfer and promotion, the hardest work will probably come in placing the system in operation. It means a campaign of education among the foremen or department heads to "sell" the proposition to them. It is often possible to present the plan in its details at foremen's or executives' meetings, although sometimes it is advisable to start the work and explain it afterward. In either case the real work must be done by the employment manager with the individuals who are affected.

Particularly in an organization which is old and the executives of which are set in their ways, the employment manager must be a strategist and a diplomat to bring about a change in method. Men in almost every organization are not inclined to give up a good worker from their department to be transferred elsewhere, and often the easiest way to convince an executive of the desirability of the new order of things is to see that he is one of the first to benefit by the change and then call upon him to make a similar sacrifice for some other department.

Another means of interesting department heads in this work and in employment activities in general is to submit to each executive periodic reviews of employment conditions in his department. In any event, success in obtaining cooperation of different executives is one of the real measures of the true employment executive.

Labor Department Keeps Up Propaganda on Continued High Prices

WASHINGTON, June 2.—With the disappearance of the Industrial Board of the Department of Commerce and its effort to secure lower commodity prices, the Department of Labor has resumed its propaganda of prediction that high prices will stay. The department bases this on the conviction that the present high wage scales will not be reduced. These statements have been issued periodically by Roger W. Babson, director general of the department's information service.

"In the present period of business readjustment," says his latest statement, "no single question appears to bear a more vital relation to the speedy return of nationwide prosperity than the question of prices. With each month that has passed since the signing of the armistice, developments have tended to upset preconceived ideas as to exactly what would happen. The one outstanding fact is that in spite of the most highly competitive conditions, brought on by a scarcity of orders in many industries, prices have not materially receded excepting for raw materials.

"Many who have pinned their faith to lower prices are pointing to declines in the cost of a few raw materials like cotton, wool and leather. They forget that wearing apparel and other manufactured products, before reaching the public, have gone through so many hands and processes, all requiring labor in its broadest sense, that the final cost is largely determined by the labor cost."

W. H. Ramsey, president of the Chamber of Commerce of Alliance, Ohio, announces that Cleveland interests have offered to erect a large steel casting plant there, to cost not less than $500,000, if a site is provided.

Iron and Steel Exports Show Increase

Heavier Movement to France, Japan and Other Countries — More Metal Working Machinery Sent Abroad — Imports Show Slight Change.

WASHINGTON, June 3.—Exports of iron and steel are gradually getting into a peace stride. The April figures compiled by the Bureau of Foreign and Domestic Commerce show an increase of $5,000,000 over the April, 1918, figures and of $4,000,000 over the March, 1919, figures. The exports of iron and steel for April, 1919, were $88,896,975 against $83,814,240 in April, 1918, and $84,720,804 in March, 1919. For the 10 months ending with April, 1919, the figures aggregated $857,185,045 against $941,085,784 for the corresponding period a year ago.

Exports of Iron and Steel

	Gross Tons			
	April		Ten Months	
	1918	1919	1918	1919
Ferromanganese	504	441	4,138	1,509
Ferrosilicon	263	297	8,524	3,552
All other pig iron	10,515	16,300	317,696	263,506
Scrap	....	442	21,806	1,968
Bar iron	3,272	5,870	41,877	73,528
Wire rods	19,845	13,364	169,927	125,551
Steel bars	60,478	39,620	530,178	393,468
Billets, ingots and blooms, m.e.s.	177,128	11,488	1,680,090	844,908
Bolts and nuts	1,868	4,711	25,617	22,036
Hoops and bands	4,499	4,496	51,205	46,768
Horseshoes	252	360	8,356	1,643
Cut nails	678	175	4,207	2,890
Wire nails	6,075	8,767	97,632	71,992
All other nails, including tacks	555	1,456	11,259	14,345
Cast-iron pipes and fittings	3,698	3,987	65,591	31,945
Wrought pipes and fittings	5,333	26,717	86,361	118,563
Radiators and cast-iron house-heating boilers	154	303	2,493	2,788
Railroad spikes	471	3,482	12,525	13,440
Steel rails	39,463	60,463	353,450	478,578
Galvanized sheets and plates	4,632	9,596	64,779	62,262
All other sheets and plates	4,104	2,923	47,878	212,784
Steel plates	34,413	92,722	379,627	615,369
Steel sheets	18,361	16,338	148,141	118,623
Ship plates, punched and shaped	2,162	915	26,882	17,489
Structural iron and steel	18,169	42,550	209,924	254,332
Tin and terne plates	24,235	19,101	183,919	210,456
Barbed wire	12,509	6,074	142,373	177,295
All other wire	12,219	14,246	146,336	142,795
Total	465,865	408,204	4,842,631	4,326,228

The tonnage figures show a decrease compared to last year's figures but a generous increase over those of a month ago. The exports of iron and steel in April, 1919, aggregated 408,204 gross tons against 465,865 tons in April, 1918, and 344,506 tons in March, 1919. For the ten months ending with April, 1919, the gross tonnage total was 4,326,228 as against 4,842,631 tons for the corresponding period a year ago. Compared with the figures of 1918, the chief decrease was again chargeable to the drop in the export of billets, ingots and blooms which collapsed from 177,128 tons in April, 1918, to 11,488 tons in April, 1919. This is due almost entirely to the cessation in the outgo of this material for European war industries. There was also a drop in the outgo of steel bars from 60,478 gross tons in April, 1918, to 39,620 gross tons in April, 1919.

The export of cast-iron pipe and fittings remained practically stationary, but there was an interesting increase in the record for wrought pipes and fittings from 5333 gross tons a year ago to 26,717 tons in April, 1919. Of this total, Mexico alone received 7165 tons, although in 1918 that country's share was only 346 tons. Japan received 4874 tons in April, 1919, against 203 tons in April, 1918. Norway and Denmark, which were not on the lists at all in the April, 1918, exports, received 1254 and 805 tons of wrought iron pipes respectively in April, 1919.

The exportation of steel rails increased from 39,463 gross tons valued at $2,236,946 in April, 1918, to 60,463 tons, worth $3,416,590 in April, 1919. Canada's share of the April, 1919, exports was 10,717 tons against 1607 tons in April, 1918. France received 15,153 tons in April, 1919, and 10,497 in April, 1918.

The exportation of steel plates almost trebled. In April, 1918, the figures were 34,413 gross tons and in April, 1919, 19,722 tons. The exportation to France of steel plates rose from 7437 gross tons in April, 1918, to 15,104 in April, 1919. Italy's share jumped from 1926 tons in April, 1918, to 12,620 in 1919. Canada's total rose from 18,235 in April, 1918, to 24,547 in April, 1919. But the most monumental jump was that of Japan. It received 1558 tons of steel plates in April, 1918, and 27,601 in April, 1919.

Structural iron and steel rose from 18,169 gross tons in April, 1918, to 42,550 in April, 1919. The exportation of pig iron increased from 11,282 gross tons in April, 1918, to 17,038 in April, 1919. Of the latter figure, 9333 gross tons went to Italy and 4363 to Canada. The export of iron ore increased from 1605 gross tons in April, 1918, to 13,024 in April, 1919. The April figures for the exportation of machinery revealed an increase of almost $9,000,000 over those a year ago, aggregating $33,448,316 against $24,869,837 in April, 1918, and $28,554,382 in March, 1919.

For the ten months' period ending with April, 1919, the figures aggregated $268,052,542 against $237,976,872 for the same period a year ago.

The exportation of metal-working machinery increased from $3,581,091 in April, 1918, to $5,611,461 in April, 1919. The exports under this heading to France rose from $901,370 a year ago to $1,532,558 in April, 1919, and to Japan from $303,151 in April, 1918, to $540,088 in April, 1919. The French increase is interesting because it came in spite of the fact that France still maintains an embargo on machinery importation. The British receipts fell from $1,549,966 in April, 1918, to $1,255,126 in April, 1919.

The imports of iron and steel into the United States show a slight increase in both tonnage and value. They rose from 11,372 gross tons in April, 1918, to 16,501 in April, 1919. The valuation figures for April, 1918, were $1,489,633—which includes items not in the tonnage figures—and for April, 1919, $1,930,591. For the 10 months' period ending April, 1919, the imports totaled 151,913 gross tons against 173,510 for the corresponding period a year ago.

Imports of Iron and Steel

	Gross Tons			
	April		Ten Months	
	1918	1919	1918	1919
Ferromanganese	2,575	4,301	23,382	22,206
Ferrosilicon	....	142	5,173	5,635
All other pig iron	550	646	16,618	2,180
Scrap	3,499	8,746	59,073	74,303
Bar iron	22	10	2,321	1,226
Structural iron and steel	157	55	6,879	2,277
Steel billets without alloys	2,183	1	32,399	21,647
All other steel billets	589	402	7,335	4,918
Steel rails	374	1,623	7,985	10,116
Sheets and plates	44	140	1,961	626
Tin and terne plates	....	47	32	48
Tin scrap	792	428	6,888	5,781
Wire rods	587	20	3,464	1,956
Total	11,372	16,561	173,510	151,913

Imports of Manganese Ore

Manganese, ore and oxide of	58,023	59,470	489,754	421,258

In April, 1918, the United States imported 75,634 gross tons of iron ore, of which 73,950 tons came from

Exports of Machinery	April		Ten Months	
	1918	1919	1918	1919
Adding machines	$168,083	$418,404	$1,709,522	$2,639,466
Air compressing machinery	138,474	294,877	1,163,898	2,637,821
Brewers' machinery	866	80,411	227,132	145,261
Cash registers	38,459	370,262	424,799	1,582,783
Parts of	1,619	20,154	51,953	130,146
Concrete mixers	37,251	22,704	243,948	219,505
Cotton gins	6,915	60,753	117,549	239,757
Cream separators	75,368	119,471	468,412	797,006
Elevators and elevator machinery	61,397	206,989	1,589,425	2,148,486
Electric locomotives	14,492	55,006	137,171	278,458
Gas engines, stationary	25,945	48,870	485,720	463,842
Gasoline engines	4,694,359	3,618,144	27,588,182	28,572,776
Kerosene engines	718,476	653,922	4,416,767	7,506,705
Steam engines	3,642,513	2,395,062	34,235,672	22,310,281
All other engines	872,971	320,331	3,094,553	4,413,177
Boilers	158,739	507,973	3,101,963	4,844,214
Boiler tubes	441,305	1,009,125	5,336,961	7,059,927
All other parts of engines	2,926,889	3,141,232	15,631,679	22,035,722
Excavating machinery	152,286	15,942	860,776	745,394
Milling machinery, flour and grist	38,439	354,147	789,105	1,580,985
Laundry machinery, power	8,721	41,563	307,018	387,783
All other	20,126	49,944	235,732	275,965
Lawn mowers	26,473	26,167	202,621	289,681
Lathes	619,523	992,784	13,570,259	7,901,800
Other machine tools	925,644	1,561,565	9,013,699	10,807,506
Sharpening and grinding machines	465,180	607,005	5,349,240	5,192,139
All other metal-working machinery	1,570,744	2,450,107	20,313,538	21,730,188
Meters, gas and water	31,945	64,934	403,552	518,774
Mining machinery, oil well	213,191	310,619	1,658,650	3,025,612
All other	707,414	654,194	9,020,989	7,573,117
Paper-mill machinery	200,609	224,889	1,556,475	1,929,770
Printing presses	74,393	344,825	1,124,537	2,026,729
Pumps and pumping machinery	501,731	720,018	5,405,598	5,744,865
Refrigerating and ice-making machinery	156,542	157,878	1,257,298	1,653,765
Road-making machinery	36,860	65,219	416,772	650,737
Sewing machines	539,397	833,227	6,668,501	9,390,283
Shoe machinery	50,477	207,785	1,284,015	1,548,388
Sugar-mill machinery	568,272	353,559	10,603,058	8,846,201
Textile machinery	504,696	1,171,196	4,202,341	8,445,172
Typesetting machines	31,520	413,596	999,638	2,403,018
Typewriting machines	402,360	1,582,001	6,174,194	8,715,295
Windmills	27,285	46,138	920,155	740,458
Wood-working machinery, saw mill	90,762	69,141	790,461	1,242,877
All other	44,691	182,033	819,264	1,137,265
All other machinery and parts of	2,836,435	6,604,150	34,005,080	45,523,448
Total	$24,869,837	$33,448,316	$237,976,872	$268,052,542

Cuba. In April, 1919, these imports were 24,195 gross tons, of which 22,143 came from Cuba. The pig iron importation in April, 1918, was 2605 and in April, 1919, it was 5087.

The importation of manganese ore and oxide of manganese remains fairly stationary. In April, 1918, it totaled 58,023 tons, valued at $1,890,397 and in April, 1919, it was 59,470 tons, worth $1,821,217.

The increase in the steel exports was but part of a record breaking month of export figures. The total April exports broke the highest previous record by nearly $100,000,000, aggregating $715,000,000 as compared with $623,000,000 for January, the previous high mark. For March of this year the total was $605,000,000, and for April a year ago, $501,000,000. For the ten months ended with April the exports were valued at $5,705,000,000, as against $4,884,000,000 for the corresponding period last year. Imports for April totaled $273,000,000 in value, a gain of $5,000,000 over the $268,000,000 announced for March, and a decrease of $6,000,000 as compared with the $279,000,000 for April of last year. Imports for the 10 months ended with April are put at $2,474,000,000 as compared with $2,362,000,000 for a similar period in 1918. This makes a trade balance for the 10 months in our favor of $3,231,000,000.

Drop Forge Men to Meet June 11 to 14

The American Drop Forge Association and the Drop Forge Supply Association will hold their sixth annual convention June 11 to 14, at the William Penn Hotel, Pittsburgh. Among the papers to be presented are the following:

Thursday, June 12.—The Iron and Steel Situation, with Special Reference to the Forging Industry, H. P. Bope, Pittsburgh; Development in the Use of Powdered Coal in the Forging Industry, W. O. Rankin, Quigley Furnace Specialties Co., New York, and Charles Longenecker, the Bonnot Co., Canton, Ohio; Industrial Misfits, A. M. Nielsen, New York; Producer Gas as a Forge Shop Fuel, E. E. Adams, Smith Gas Engineering Co., Dayton, Ohio; Sand Blasting vs. Pickling, R. R. Shuman, Chicago.

Friday—Material Testing, Prof. John H. Nelson, Wyman-Gordon Co., Worcester, Mass.; The Forge Man Is Entitled to His Profits, F. A. Ingalls, Ingalls-Shepard Forging Co., Harvey, Ill.; Die Cost as a Factor in Selling Forgings, R. T. Herdegen, Dominion Forge & Stamping Co., Walkerville, Ont.; The Bonus System in the Forge Plant, Lee K. Wilson, Timken-Detroit Axle Co., Detroit; A Plan for Standardizing Quotations on Drop Forgings, H. N. Taylor, president N. & G. Taylor Co., Philadelphia; Heat Treating Problems That Originate in the Forge Shop, W. C. Peterson, Packard Motor Car Co., Detroit; Low Pressure Exhaust Steam Turbine, H. V. Schoepflin, Westinghouse Electric & Mfg. Co., Pittsburgh; Electric Welding as Applied to the Drop Forging Industry, S. W. Miller, Rochester Welding Works, Rochester, N. Y.

The report of the Standardization Committee will be received Thursday morning. The annual meeting of the Drop Forge Supply Association will be held Friday morning. On Saturday morning a number of plants will be visited.

Supply of American Manganese Ore

WASHINGTON, June 2.—The supply of native manganese ore in the United States can meet our domestic requirements for only three years if there were no importations, according to a report on the manganese situation compiled by the United States Tariff Commission. The report carefully avoids a recommendation on the question of establishing a protective tariff for this commodity. The commission's analysis presents some interesting details of the competitive position of the United States in the manganese industry of the world.

The Societe Francaise D'Action Economique, 1 rue des Italiens, Paris, France, which is represented in this country by Daniel T. Pierce, 149 Broadway, New York, reports that it has inquiries from French firms which desire agencies in France for building hardware, portable wooden dwellings, automatic machinery, electrical supplies, oil and lubricants for industrial purposes.

Little Governmental Meddling Expected

Director General Hines Willing to Have Steel Companies Attacked, But Prevailing Sentiment in Washington Seems to Be in Favor of Not Hampering Business

WASHINGTON, June 3—Although there have been suggestions from time to time that the bitter criticism of the steel industry made by Director General Hines of the Railroad Administration, and backed up by Secretary Glass of the Treasury Department and Attorney General Palmer, foreshadowed hostile action by the Government, it seems certain now that nothing will be done for the present at least. It does not seem likely in any event that anything would be done in the absence of President Wilson, especially as the "price schedule" against which Mr. Hines inveighed was made up with the direct sanction of Secretary Redfield of the Department of Commerce. This would leave a split in the Cabinet over the issue, and it is doubtful whether a divided Cabinet would determine upon a course fraught with so much importance to the Administration.

It has become known, however, since the allotment of the 200,000-ton order of steel rails, that Director General Hines seriously considered following in the footsteps of the Navy Department and attempting to commandeer the steel needed by the railroads. He was advised, however, that there was some doubt about his having the war powers which the navy had for such emergencies. Rather than test the issue at this time, Mr. Hines yielded and purchased the rails at the prices fixed by the steel companies. Mr. Hines has made no effort to conceal that he intended his attack on the steel companies to be as vigorous as it could be made, and that, at least as far as he is concerned, he would not object to operations by the Department of Justice to carry out his line of assault.

Attorney General Silent

Nothing has come from Attorney General Palmer's office, however, and apparently he is content to let the matter rest on the basis of his opinion of April 7, which really resulted in the dissolution of the Industrial Board of the Department of Commerce.

As President Wilson made no suggestions concerning further industrial legislation looking toward reconstruction, in his message to Congress, the chief interest of industry in the work of the national legislature now will center in the proposed revenue legislation and the possibility of labor legislation. The revenue legislation was to start with a repeal of the luxury taxes, and other "obnoxious consumption taxes," as President Wilson labeled them, then there were to be some special protective tariff bills for war industries, and finally a general revision of the tariff.

But even the repeal program struck a snag. In the Ways and Means Committee, and out of it, there was a fear that the proposed reductions of the treasury income would hamper the Government, and finally force another bond issue. It is likely that ultimately the luxury taxes will be repealed, but it is becoming increasingly doubtful whether this repeal will be extended to many other consumption taxes.

Special Tariff Bills

Chairman Fordney has announced that special tariff bills will be approved by the Ways and Means Committee to increase the duties on chemicals, dyestuffs, potash and laboratory glass. It is possible that manganese will also be made the subject of special legislation, as the Tariff Commission has declared that the manganese industry in this country cannot live without some such help. President Wilson is on record in favor of legislation to protect these "war industries."

With this work out of the way, the Ways and Means Committee expects to begin hearings "some time after July 4" on a general revision of the tariff. The hearings promise to be most comprehensive and probably will consume about two months. The committee plans a thorough job, and will attempt to secure all available information concerning the effect of the war on industries at home and abroad, especially as far as this will relate to the question of the maintenance of future markets. There is little prospect of a completed bill, however, before October. It takes a long time to write a general revision of the tariff.

Labor Legislation

The program of labor legislation is far from complete. The Department of Labor is using every ounce of its influence, aided by that of the American Federation of Labor, to continue the Employment Service. An attempt to maintain it through a rider on the urgent deficiency bill failed on a point of order against new legislation. It will come out again in the sundry civil appropriation bill, and a special measure has also been drafted which would create the service as a special bureau of the Department of Labor. There is every prospect of a bitter controversy, the chief complaint against the proponents of the service being that it has been used as a union labor organization and has discriminated against non-union labor.

Besides this, the labor program worked out by the Paris Peace Conference may figure in the coming session, although it is likely that the labor committees of the two houses will not attempt to secure action on anything radical until after the peace treaty and League of Nations difficulties are out of the way.

Trying to Get Information

The Industrial Board fiasco has left matters in such shape that there is little present prospect of Government interference with industry in general. The Department of Commerce is trying to get some information from abroad concerning conditions, especially in Europe, but the reports to date have been far from comprehensive. Fifty-one special agents are now in Europe, but they have brought in little that shed light on the real industrial situation. Even inside the Department of Commerce it is admitted that the industries themselves are better informed through the ordinary industrial channels concerning conditions overseas than is the department. Practically no effort has been made to learn what the condition of any industry is inside of Germany. A commissioner was sent over to find out what the dyestuffs situation might be, but he ran into a lot of political snags in Paris and gave it up. Alexander Luchars, who was commissioned to investigate the machine tool situation, has been delayed, but is expected to leave some time during the month.

The Government has been turning over some of its confidential information to the American Iron and Steel Institute for the benefit of the industry, but has made no effort to distribute any special reports.

Plans of French Government

There is considerable interest for the iron and steel industry in the report of Commercial Attaché C. D. Snow at Paris concerning the plans of the French Government to revise its customs laws. Minister of Finance Klotz has proposed a new schedule of ad valorem surtaxes on imports. According to M. Klotz, the increase of prices has resulted in a decreased percentage of protection from the specific duties. The purpose

of the ad valorem surtaxes will be to make the total new customs duty equal the protection afforded by the specific taxes before the war.

"The French import duties," cabled Mr. Snow, "which are nearly all specific in form, were adopted at a time when the average prices were much lower than at the present time and when the duties were equivalent to a higher proportion of the actual value of the goods. By reason of the increase in prices, the duties now represent a much smaller percentage of the value of the goods and the protection to domestic industries is proportionately less."

As the new surtaxes are put into effect, it is proposed to accelerate the removal of French import restrictions. O. F. S.

British Steel Output in 1918

The following table gives the output of steel ingots and castings in Great Britain in 1918 as compared with 1917 in gross tons:

	1917		1918	
Bessemer ingots, acid	1,059,281		788,355	
Bessemer ingots, basic	602,265	1,661,546	567,650	1,356,005
Open-hearth ingots, acid	4,413,843		3,901,136	
Open-hearth ingots, basic	3,421,170	7,835,013	3,924,415	7,825,551
Electric steel ingots		57,156		103,021
Total steel ingots		9,553,715		9,284,577
Steel castings, Bess. and O. H.		186,920		261,950
Electric steel castings		63,444		44,901
Total steel ingots and castings		9,804,079		9,591,428

The decline in 1918 as compared with 1917 was due in part perhaps to the signing of the armistice in November.

Coke Production Increasing

UNIONTOWN, PA., June 2.—With the time at hand for contracts for the last half of the year, the coke market is now more favorable to the producer than at any time since the armistice was signed. Free coke is a mighty scarce article in coke plants in the Connellsville region and what loose tonnage is standing on track is mostly being held for price. The maximum price for spot furnace coke has remained at $4 for two weeks and the low price has risen from $3.60 to $3.85. Little tonnage was moved at the present low price last week, however, $4 being the prevailing price, with any number of operators holding out for $4.25.

That the coke region has now safely passed the crisis and is now again on the upgrade is the belief of a number of operators upon an analysis of the week's developments in the trade. Ovens were put in at a number of plants after having been temporarily suspended. At the same time unconsigned loads took a substantial drop. That demand for coke is increasing is shown by the fact that the market remained firm, although production was increased. Nine coke operations resumed work last week.

Chicago Meeting of Mining and Metallurgical Engineers

Plans for the meeting of the American Institute of Mining and Metallurgical Engineers at Chicago next September are assuming definite form. Monday, Sept. 22, the opening day, will be devoted to registration at the Congress Hotel. Monday afternoon the first session for presentation and discussion of technical papers will be held and in the evening there will be a smoker. Tuesday an excursion is planned by boat to Gary for a trip through the steel mills. Wednesday will be devoted to technical sessions, morning and afternoon, and in the evening the banquet will be held at the Congress Hotel. Thursday and Friday will be taken up with various excursions to industries in Chicago and Milwaukee.

The Columbia Steel & Shafting Co., Pittsburgh, has placed a contract for the erection of a warehouse in Cleveland. The building will be 147 x 157 ft.

CANADIAN STRIKES

Much Trouble Caused in Iron Plants, but Worst Apparently Over

TORONTO, ONT., June 3 (*By Wire*).—The members of the metal trades unions who are on strike for a 44-hr. week and collective bargaining are causing considerable trouble among the iron and steel and machinery manufacturing plants. The Steel Co. of Canada states that its plant at Swansea, Ont., has been shut down for two weeks, while in the majority of other plants in the city from 60 to 80 per cent of the regular staff employed are out. This is not the case, however, in all plants. Some are experiencing very little inconvenience. The Massey-Harris Co. stated that its staff is as large now as at any time, and men who have been out are now coming back.

Men in the machinery trades on strike include 3000 machinists and tool makers, 800 molders, 600 shipbuilders and boiler makers; metal polishers, etc., 400. In addition to these, there are about 4000 sympathetic strikers of other trades out.

Considerable inconvenience is felt in the machine tool and machinery trade, as it is impossible to fill orders already on their books and new business coming in will have to wait for about two or three months before delivery can be made. According to the present outlook the worst of the strike is now over, as in most cases the sympathetic strikers have been ordered back, while a great number of men from the metal trades unions have started to weaken and a settlement is expected before long.

Trade Balance in Favor of Philippines

Imports of iron and steel and their manufactures into the Philippine Islands in the calendar year 1918, according to a report of the Department of Commerce and Communications, Bureau of Commerce and Industry, Manila, amounting to $12,253,985. Total imports into the Philippines in 1918, which the United States shared with the rest of the world, amounted to $98,599,212, against total exports of $135,194,482. The department points to the excess of exports over imports as indicating the buying power of the islands and says:

"Undoubtedly, United States manufacturers and importers should show the same interest that foreign concerns do in securing staple products of the Philippine Islands, the production of which is merely in its initial stages. United States manufacturers and exporters should also be concerned in extending their trade in a variety of wares in a field which has been barely touched."

A total of 81,741 disabled soldiers and sailors have registered for vocational training with the Federal Board for Vocational Education, Washington, and 2079 have started their training. Of the 4376 cases approved for teaching by the board, 1200 have been approved for trade and industrial training, 846 for agricultural, 850 for professional courses, and 392 are taking academic courses. Those taking up some branch of mechanics involving operation, repair and up-keep of gas engines number 291. The course in tractor operation has 31 students, differing from Canadian conditions where tractor operation is one of the courses most eagerly sought.

A combined meeting of the Boston Section American Society of Mechanical Engineers and the Boston Society of Civil Engineers was held May 21, at Boston. Past President Frederick H. Fay and President Leonard Metcalf discussed "The Movement to Establish a National Department of Public Works." Calvin W. Rice, secretary American Society of Mechanical Engineers, Albert G. Duncan and Walter B. Snow described the progress made by the aims and organization committee of their national body.

PUDDLERS' DEMAND

Iron Manufacturers to Be Confronted by New Scale—Other Labor News

YOUNGSTOWN, OHIO, June 2.—Bar iron manufacturers will be confronted by a new puddling scale when they meet representatives of the Amalgamated Association of Iron, Steel and Tin Workers in June at Atlantic City, to discuss the wage scale for the ensuing year. Puddlers have framed a demand for a 5 per cent increase in the base rate of 1918-1919 iron selling at 1.25c. and up to and including the 1.75c. card. For iron selling at 1.80c. and over, an increase of 10 per cent is asked. This proposed increase in the wage scale is designed to apply not only to boiling, but also to busheling on sand bottom, busheling on cinder bottom, muck or puddle mills, piles on boards, knobbling, heating slabs and shingling scale, bar and 12-in. mills, mills making a specialty of working pipe or skelp from iron or steel, plate and tank mills, guide, 10-in. and cotton tie mills.

Should the wage scale now demanded be adopted at the conference, the list of wages based on the average selling price of $4.35 per 100 lb. for sheets, would be the minimum for the year ending June 30, 1920. Black sheets, No. 28 gage, are now selling at $4.35 per 100 lb. at the Pittsburgh mills, which means that the proposed new scale will stand at the $4.35 basis whether sheets remain at present prices or fall.

The scale to be submitted to the manufacturers provides that rolling shall begin on sheet and jobbing mills not earlier than 6 a. m. Monday and the week's work shall end after the first 6-hr. shift on Saturday. Besides asking for a 6-hr. day in sheet and tin plate mills, the Amalgamated has formulated a demand for an 8-hr. day for muck, bar and other mills.

Advance for Molders

Molders in the brass and aluminum foundries in Cleveland have been granted a wage increase of from $5.50 to $6 per day and an 8-hr. instead of a 9-hr. day, commencing June 1. About 700 men in 28 of the city's 35 shops are affected. They will receive an addition of 40c. a day Jan. 1, 1920. The heavy gray iron foundries in Cleveland have reached an agreement with their molders on a wage scale of $6 for an 8-hr. day. The molders have been getting $5.50 for a 9-hr. day and demanded an 8-hr. day with a minimum rate of 80c. per hr. The employers are willing to enter an agreement with their men on a new basis for a period extending until Jan. 1, 1921, but the molders object to being tied up for so long a period, and are willing to enter an agreement only until Jan. 1 next.

Welfare Work in Iron Industry

WASHINGTON, June 1.—The iron and steel industry stands high in its welfare work for employees, according to the special report on this subject which has just been issued as Bulletin No. 250 of the Bureau of Labor Statistics. The document is the result of a survey of 431 establishments in the United States, 49 of which were foundries and machine shops and 40 others iron and steel industries. Forty-eight of the foundries and machine shops, with a total payroll of 147,275 employees, reported first-aid equipment, 35 have hospitals or emergency rooms, 23 employ doctors and first-aid attendants, and 19 have nurses. In 36 other iron and steel plants with 202,773 employees, four reported first-aid equipment, 32 have hospital or emergency rooms, 21 employ plant physicians, 25 have nurses, and 10 have first-aid attendants. The reports from 35 foundry and machine shops with 116,193 employees reported an average of 34,258 treated. In 31 other iron and steel plants with 132,979 employees the average number of cases treated monthly was 23,520. In 33 out of 40 iron and steel plants reporting, the welfare work is administered by the employer alone. In only seven is there joint control by employer and employees. In 28 of the foundries and machine shops the employer administers the welfare work alone, while in 28 of these there is joint control.

The report devotes an interesting chapter, with illustrations, to a description of the emergency hospital construction and equipment of a large steel company. The document is accompanied by a series of statistical tables, and is elaborately illustrated. It may be obtained by application to the Bureau of Labor Statistics in the Department of Labor.

To Reward Workers for Thrift

The General Motors Corporation, now one of the largest industrial organizations in the world, has adopted a plan which is somewhat akin to profit sharing, but the purpose of which is to encourage thrift among its workers as well as to permit them to share in the corporation's profits. The plan is called a "savings and investment plan," and some of the principal features of it are outlined as follows:

All employees who have been in the employ of the corporation or its subsidiaries for three months or more are eligible to participate in the plan. Each employee shall have the right to pay into the savings fund each year an amount not to exceed 10 per cent of his wages or salary, and in no event shall the amount so paid exceed $300 per annum. Payments must be made in amounts of $5 or multiples thereof.

The corporation will also establish an Employers' Investment Fund, and will pay into such fund an amount equal to the total net payments made by the employees into the savings fund. The corporation will credit interest semi-annually at the rate of 6 per cent per annum upon all amounts paid into the funds.

The savings and investment funds will be divided into yearly classes, that is, a new class will be formed each year to be designated "Class of 1919," "Class of 1920," "Class of 1921," etc., and each class will mature five years from the date of its formation; thus the Class of 1919 will mature on Dec. 31, 1924, the Class of 1920 will mature on Dec. 31, 1925, etc.

The amounts paid into each respective class of investment fund by the corporation will be credited over a period of five years to the individual employees participating in the corresponding classes in the Savings fund, that is to say:

One-fifth thereof will be credited one year after the date of the respective payments into the savings fund; one-fifth two years after the date of the respective payments into the savings fund and so forth.

Safety Work Improving Shop Relations

R. M. Little, director Safety Institute of America, New York, addressed an enthusiastic audience of industrial managers and their assistants at a meeting arranged by the Northeastern Ohio Safety Council at the Statler Hotel, Cleveland, May 26, on "Forethought versus After-thought in Safety." Mr. Little brought to mind in a forceful manner that safety work, or better, accident prevention, has been given a place of prime importance in our life through the impetus it has received from industry. For years industrial concerns had not in any way desired the accidents which kill and maim and cause misery. Equally true, the employees do not want to suffer these things. It was a common problem and industry worked out the transformation that changed the old proverb, "Accidents will happen," into, "Accidents can be prevented"—prevented because it is being done every day. Since safety work is a thing of such mutual interest, it has become the "common denominator" between men and management whereby many of the rough places are being smoothed out. It is especially significant and appropriate that America should be leading in this as all the world is looking to us for the solution of industrial unrest.

"That forethought is better than after-thought in this work is a truism," said Mr. Little. "To remove the possible cause of an accident is infinitely better than any cure. That such is a manager's affair need hardly be mentioned, since they determine so largely the place, equipment, light, air and all conditions involved for workers. And further, unless there is a management solidly and earnestly convinced that safety work is worth while, expressing this faith by safeguards and safe working conditions, little real co-operation on this

score can be secured from the men. Safety work is a vital factor in the conservation of life, a fact not to be taken lightly in view of the unquestionable labor shortage which our country will suffer because of the war, not only on account of the actual time a prevented accident saves for shop work but also because of the better understanding and more wholesome relations that invariably arise between management and men when a comprehensive safety program is put through with sincerity and honesty of purpose.

Opportunity Monographs

To enable the disabled soldier or sailor to choose another occupation wisely, the Federal Board for Vocational Education, Washington, has prepared a series of "opportunity monographs," each giving vital facts concerning some occupation suitable for a physically defective man. Their scope covers a description of the processes of manufacture or activity, average wages, physical and mental qualities needed, chances of promotion, and compensating features outside of wages. In the automobile manufacturing monograph there is a classification of occupations with reference to disabilities, telling in what departments men afflicted with total blindness, loss of an eye, deafness, etc., might fit.

The series covers the following occupations: Journalism, the lumber industry, automobile manufacturing, farm management, teaching, commercial occupations, electrical manufacturing. As stated in the last mentioned, "electrical machinery and device factories often embrace foundries, paint shops, pattern shops, blacksmith shops, tin and press shops, and other shops in which are performed certain processes necessary for the production of the electrical product in which that concern specializes." In the automobile monograph it is stated, "no attempt has been made to go into the machine shop side of the industry, a field in which lie possibilities for placing thousands of reeducated men in good positions. The monograph is limited to automobile assembly work."

Among the disabled soldiers being trained by the Federal Board, 20 have taken up oxy-acetylene welding, three, boiler-making and two air-brake operation. The most popular profession seems to be dentistry with 31 students. Of the 20,000 disabled soldiers returned to this country, the central office of the board had approved courses for 4,376 men May 1. The amount given the man in training varies according to the size of the family. A single man gets at least $65 a month, but there is a graduated scale for a married man with children, based on family requirements. For instance, if he has a wife and four children and must live away from home during training, he will receive $122.50.

Helping Employees Buy Homes in Detroit

To aid its employees in acquiring their own homes the American Blower Co., Detroit, has organized an advisory and financial service in its welfare department. This is an outgrowth of the savings and investment movement resulting from war finance experiences. It is laid down as a general proposition that any married employee earning $25 a week is in a position to invest $3,300 in a cottage and lot, and that this will be cheaper than average Detroit rents, as well as give better living quarters and independence.

If an employee owns an $800 lot or has that sum in savings with which to buy one, it is possible to build a $2,500 cottage on it. The first step is to select the lot, if one has not already been purchased, and, as location is important in determining mortgage value, the company advises that employees confer with the secretary of the Society for Savings, a Detroit institution. The next step is securing a loan for building. The Society for Savings will lend 60 per cent of the total value of house and lot. The lot being $800 and the house $2,500, this yields $1,980 on a mortgage. Before building can start it is necessary to borrow $520 additional, and this is loaned by the American Blower Co. One mortgage covers the whole transaction, as the Society for Savings issues the mortgage for $2,500 and the company pays the additional $520 into that institution. Care is taken to make clear to employees that this is not benevolence on the company's part, because the Society for Savings issues certificates of deposit to the company for its money, and these certificates pay 5 per cent interest.

The same general plan applies to the worker with smaller savings, but a minimum of $300 is set as the limit of value of a lot as the basis.

Industrial Training

Two "vest pocket bulletins" have recently been sent out by the United States Training Service, Department of Labor, Washington: No. 6 entitled, "Labor Turnover and Industrial Training" and No. 7, "Industrial Training and Foreign Trade." The first promotes the idea that industrial training is necessary to prevent excessive labor turnover, while the second maintains that industrial training is necessary for America to compete successfully with other nations in the coming commercial war.

The United States Training Service has 18 representatives in Boston, Rochester, Bridgeport, New York, Philadelphia, Pittsburgh, Cincinnati, Cleveland, Detroit, Milwaukee and Chicago. Such representatives will survey a plant upon request and give advise on this subject.

Strike Taken to Court

The foundry owners of Worcester, Mass., have taken the molders' strike to the courts. The Reed-Prentice Co. and the Holyoke Machine Works have brought bills in equity in the Superior Court, praying that injunctions be issued restraining the striking molders from picketing the works of the petitioners, and alleging intimidation and conspiracy. It is understood that the constitutionality of two Massachusetts statutes will be attacked by the petitioners, one entitled the anti-injunction act, passed in 1914, the other the peaceful picketing act of 1913, neither of which has been fought out before the full bench of the Massachusetts Supreme Court. Apart from the court proceedings, the strike continues without change.

In the Labor World

The superintendent of a large manufacturing plant has given emphatic testimony regarding the benefits of industrial training, in a recent bulletin issued by the U. S. Training Service of the Department of Labor. The pamphlet is entitled "A Business Man's Experience with Industrial Training," and E. A. Barnes, superintendent of the General Electric Co.'s plant at Fort Wayne, Ind., is the author. Mr. Barnes believes that industrial training as promoted by the Training Service should be generally adopted in American industries.

The members of the Shelbyville Manufacturers' Association, Shelbyville, Ind., have superseded the bonus system by granting a flat increase in wages to their employees, receiving the same pay for 55-h. week as they formerly did for a 60-hr. week.

A flip of a coin settled a strike of union sheet metal workers in Newburg, N. Y., and vicinity after employers and employees had come to no agreement. The strikers insisted upon $5.40 and their employers on $5.25 a day wages. The coin favored the employees.

Effective June 2, the Draper Corporation, Hopedale, Mass., has established 48-hr. week basis at its textile machinery works, with accordant advance in wages over the former schedule. Machinists at the plant recently asked for an 8-hr. day. The company is now employing about 2000 persons.

Machinists and toolmakers at the plant of the Mergenthaler Linotype Co., 24 Ryerson Street, Brooklyn, manufacturer of linotype machines, declared a strike on May 23, with demand for 44-hr. week and wage increase; the toolmakers want an advance from 82 and 85c. per hour to 90c., while the machinists seek an increase from 73 to 80c. Fifty unskilled women workers are among the strikers, with request of uniform wage scale of 44c. per hour.

SHORT TRADE ITEMS

The officers of Victor E. Karminski & Co., Inc., recently organized to engage in exporting iron and steel products, are as follows: President, Victor E. Karminski; first vice-president in charge of sales, H. Lad Landau; vice-president in charge of purchases, John H. Allen; treasurer, Alexander Karminski; and secretary, M. Frank. The company's offices are at 291 Broadway, New York. Victor E. Karminski was one of the founders of the W. J. Crouch Co., which later merged with Rownson, Drew & Clydesdale, Inc. Mr. Karminski became secretary and joint general manager of the combined companies, from which position he recently resigned. Mr. Landau served as export sales manager for the Buffalo Specialty Co. and later for the Baker-Vawter Co., and still later became connected with the Vulcan Steel Export Co. Mr. Allen organized the Manhattan Rail Joint Co., later selling out to the Elyria Iron & Steel Co. He also served with the Vulcan Steel Products Co. Alexander Karminski was for 12 years connected with the banking house of Asiel & Co.

The Sharon Steel Hoop Co., Sharon, Pa., has petitioned the Interstate Commerce Commission at Washington to order the Pennsylvania, Erie, Wheeling & Lake Erie and the New York Central railroads to pay an aggregate of $22,581.94 for complete reimbursement of costs in spotting cars within the company's plant and in the future to pay the company the actual cost of such service. The complainant says the railroads perform the same service for the Republic Iron & Steel Co., Youngstown Sheet & Tube Co., Brier Hill Steel Co., and other manufacturers at cost, while the Sharon Steel Hoop Co. is allowed only 84c. per car. From June 1, 1917, to April 1, 1919, the company received $7959.60 from the railroads for a service which, it says, actually cost it $30,532.54.

The Roberts Co., 1049 Drexel Building, Philadelphia, has been incorporated and will engage in consulting and contracting engineering with especial attention paid to rolling mill, steel plant and special machinery fields. A. L. Roberts is president and V. F. Signorelli secretary and treasurer of the new company. Mr. Roberts has been associated with such companies as the Morgan Engineering Co., Alliance, Ohio; Pawling & Harnischfeger Co., Milwaukee; Brown Hoisting Machinery Co., Cleveland, and the Bethlehem Steel Co. during the past 30 years. Mr. Signorelli has for the past five years beeen secretary and treasurer of the Southwark Foundry & Machine Co., Philadelphia.

The German export price to Switzerland of beams having been reduced by a further 100 fr., the price in early May was 500 fr., or about 3½c. per lb. The reason for this reduction is that the French for some time past have been undercutting the prices of the German Steelworks Union in Switzerland, by material from the Lorraine works. The sales are in the hands of a new group, composed of Swiss merchants, under French control, who do not belong to the Swiss Merchants' Association of the German Steelworks Union.

The Commonwealth Steel Co.'s plant at Granite City, Ill., near St. Louis, was closed last week for the first time in five years. Six months ago 3800 workmen were employed at this plant. This force was gradually diminished until in recent weeks only 600 men were at work. This is the second large steel plant near St. Louis to cease operations within the last month, the American Steel Foundries plant having closed on May 1. A. T. Morey, general manager of the Commonwealth Steel Co., said the company had no plans at present as to re-opening the mill.

Australia made great headway in her machinery industries during the war, according to a report from Trade Commissioner A. W. Ferrin at Melbourne, who has sent to the Bureau of Foreign and Domestic Commerce a list of industries either started during the war or stimulated by the lack of import competition. This statement was compiled by W. Leitch, who during the war was Director of Munitions in Australia, and who latterly has been Director of Commerce and Industry.

The Beckman & Linden Engineering Corporation is installing a 100 k.w. electric furnace in their laboratories at 41 Minna Street, San Francisco, Cal., to be used for research and investigation work for clients. It is believed that this is the only electric furnace installed for such purposes west of Niagara Falls. It will be ready for operation within 60 days.

The right to manufacture and sell a dynamometer for measuring the pressure exerted by milling cutters has been acquired by the Cincinnati Milling Machine Co., Cincinnati. The device was designed by R. Poliakoff, 711 Flatiron Building, New York, and was described in THE IRON AGE, issue of Aug. 22, on page 447.

B. W. Parsons Co., 1001 Pioneer Building, St. Paul, Minn., will represent the Pollak Steel Co., Cincinnati, in St. Paul, Minneapolis, Duluth and the Iron Range district, as Northwestern sales representative, selling forgings, car and locomotive axles, locomotive parts, repair parts, special heat-treated products, and marine and industrial forgings.

Paul W. Koch & Co., 19 South Wells Street, Chicago, have opened Pacific Coast Offices at 114 San Fernando Building, Los Angeles, Cal.; 324 Rialto Building, San Francisco, and 342 Sherlock Building, Portland, Ore. The company is the sole distributer of the "Jiffy" line of adjustable cutters, punches, jacks, clamps, and pipe tools.

The Metal & Thermit Corporation, 120 Broadway, New York, has issued a folder, which illustrates the operations involved in making a thermit weld on the 13½-ton broken upper jaw of an alligator shear used by Joseph Joseph & Bros. Co., Modena, Pa. The break welded was 80 in. in length and varied from 4½ to 23 in. in thickness.

To pre-empt and develop trade routes to South America and other lands and to take over bottoms built during the war, the United States Maritime and Development Co. was organized last week by prominent Detroit business men and others interested in the possibilities of foreign trade. The company, incorporated under the laws of Delaware, is capitalized at $600,000.

An improved dumping arrangement for use with their type E stoker is announced by the Combustion Engineering Corporation, 11 Broadway, New York. This is a square bar dumping device adopted in place of the former round trunnion design and is for the purpose of facilitating the dumping operation.

The International Harvester Co. has bought the Chattanooga Plow Co., Chattanooga, Tenn., manufacturer of chilled plows. This purchase supplements the recent acquisition of the steel plow plant and business of the Parlin & Orendorff Co., Canton, Ohio.

The Canada Carbide Sales Co., agent of the Southern Ferro Alloys Co., Chattanooga, Tenn., has opened a Chicago office at 549 McCormick Building. The Chattanooga company is producing silvery pig iron, Bessemer and 50 per cent ferrosilicon.

The Best Co., 1409-1410 Arrott Building, Pittsburgh, is equipping and building a fabricating plant at Etna, Pa., near Pittsburgh. There will be no foundry in connection with this plant, and the company has bought its needed equipment.

A Rennerfelt electric furnace of 300 lb. capacity and 60 k.v.a. has been sold by Hamilton & Hansell, Inc., New York, to the General Chemical Co., to be installed at their plant at Laurel Hill, Long Island, N. Y.

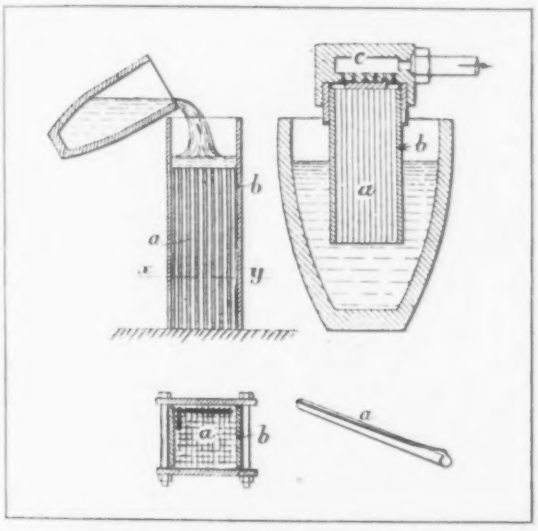
The Union Drawn Steel Co., Beaver Falls, Pa., announces the opening of a branch sales office at 608-610 Rockefeller Building, Cleveland, with Fred C. Young as district sales manager.

French Method of Making Ferrocerium in Sticks for Pyrophoric Use

Stating that, when operating by the ordinary methods in preparing ferrocerium, one runs the risk, in heating this highly oxidizable metal, of consuming an appreciable quantity, M. J. Camillo in a French patent, No. 485,710, Nov. 8, 1917, gives details of an improved process of preparing this interesting pyrophoric alloy. *Le Genie Civil* gives an account of the process and the following is a translation which supplements data published in THE IRON AGE, April 24, where the possible use of this alloy in making cerium steels was referred to:

The invention consists in pouring into a refractory furnace, heated by gas or electricity, a salt whose fusion point is slightly higher than that of cerium, for example, chloride of barium for the melting of which it suffices to heat the crucible to about 850 deg. C. Into this are then introduced in definite proportions and in the following order: Cerium, 47½ parts by weight; copper, 1 part; iron, 16½ parts. This forms an alloy which with the iron can be melted in a crucible without the necessity of raising the temperature which should not, in any case, attain 1000 deg. C.

It remains to transform this fused alloy or metal into small sticks which is accomplished by pouring the melted alloy into a mold *b*, composed of little tubes of sheet iron, *a*, held together by a quadrangular iron



Ways the French Use for Preparing Small Rods of the Pyrophoric Alloy, Ferrocerium

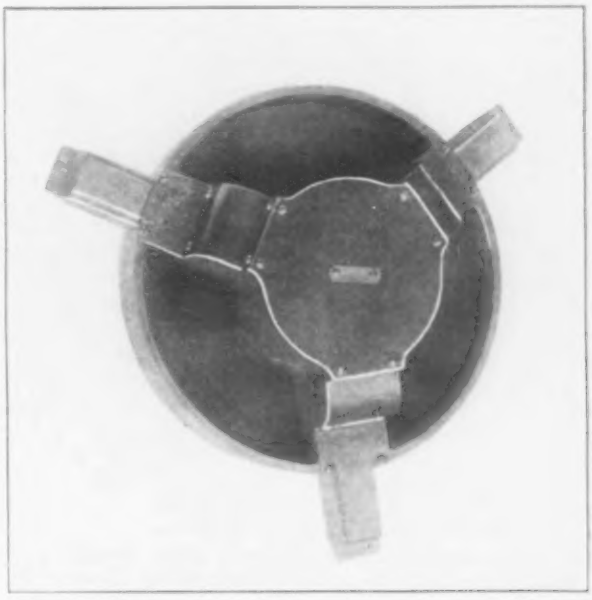
box, as illustrated. Instead of pouring the contents of the crucible into the mold, the reverse procedure can be adopted—plunge the multiple complex mold, *ab*, into the melted alloy contained in the crucible and draw up the alloy by suction into the mold by a tube attached to the bottom of the mold, as shown.

After having allowed the mold and its contents to cool in a pile of sand, the tubes, *a*, are separated from their enclosure, each one of the tubes containing a small fine metallic stick of ferrocerium which must be detached from the tube. This operation is carried out in several phases and by the use of several separate tools. It is facilitated by the construction of the tubes themselves, each one of which is made by a sheet of metal rolled up as indicated. So constituted, it is easy to open them by following the seam with special tools.

The fifth annual national exposition of chemical industries will this year be held in Chicago at the Coliseum and First Regiment Armory during the week of Sept. 22, and as usual there will be a number of society meetings held jointly with it. Among these are the American Electrochemical Society, the American Institute of Mining and Metallurgical Engineers, the American Ceramic Society and the American Steel Treaters Society. The Mining Institute is arranging a pyrometry symposium, and special stress will also be laid upon the iron and steel industry by the institute.

Pneumatic Chucks for Tires

The 12-jaw chuck illustrated is a special chuck designed by Neidow & Payson Co., 9 South Clinton Street, Chicago, for use in connection with a solid rubber tire trimming machine. It will take tires from 28 to 36

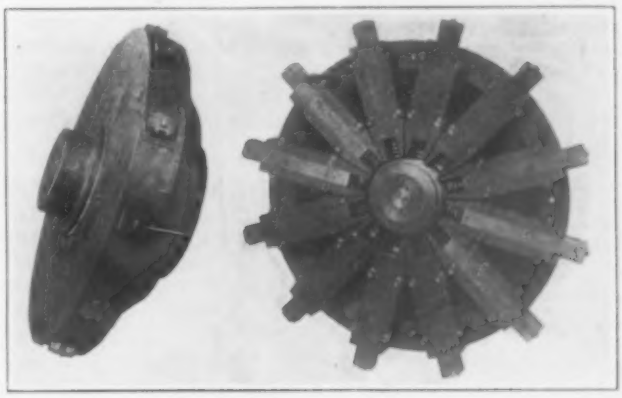


Three-Jaw Chuck Used on Pneumatic Tire Making Machine. It will take work from 17 to 24 in. in diameter

in. in diameter, the jaws having a movement of over 4 in. each. Owing to the narrow width of the small tires, it was necessary to make the chuck only 3½ in. wide on the outside diameter. The 12 jaws were required so as not to spring the tire ring out of shape. All working parts are fully enclosed, thus to make them dust-proof and eliminate danger of injuring the workman.

The chuck can also be made for external gripping by using false jaws. The movement of the jaws is obtained through a rack and pinion. The chuck is operated by one of the company's 12-in. standard double-acting air cylinders.

The three-jaw chuck illustrated is being used on a pneumatic tire-making machine. The interior construc-



Air Operated 12-Jaw Chuck Designed for Use in Connection with a Solid Rubber Trimming Machine. It will take tires from 28 to 36 in. in diameter

tion is similar to that of the 12-jaw chuck. It has a range from 17 to 24 in., which is the size of the cores used in making the regular range of pneumatic tires. It is operated by a 10-in. double-acting air cylinder.

The time saved by the use of these chucks over hand-operated chucks, which they replaced, is a feature emphasized.

There was a large increase in the output of Tunisian manganese ore deposits during the war. The last return before 1915 was 1909, when the output was 815 tons. Six years later, 1915, the amount had risen to 1460 tons; in 1916 the output was 2027 tons, while in 1917 it had increased to no less than 5800 tons.

Book Reviews

Punches and Dies. By Frank A. Stanley. Pages x + 434, 6 x 9 in.; numerous illustrations. Published by McGraw-Hill Book Co., Inc., 239 West Thirty-ninth Street, New York.

This book has been written with the object of placing before die-makers, tool-makers and tool draftsmen, certain definite information not heretofore available as a whole, although some of the material is necessarily of a fundamental character with which all mechanics must familiarize themselves in their progress toward a reasonably complete knowledge of the subject of press tools and their construction. The author states that practically 90 per cent of the material in these pages is published for the first time. The remainder has been selected from current articles originally published by the author and by other contributors to the technical press. The book is comprehensive, covering the layout, construction and use of punches and dies, the text being well supplemented with numerous illustrations.

Under the subject of press tools in general, the various forms of press tools are classified according to their action upon materials into those that operate by cutting or shearing the metal; that shape the article by drawing the material, causing it to flow under tension; that manipulate the stock or the blank already cut out by some form of bending process; that operate by compressing, squeezing or forcing the material, thus causing it to flow into the desired form. Chapters then follow describing the various dies that come under these classifications, including blanking and piercing dies; cutting off, shaving, trimming and drawing dies; combination and compound dies; embossing, marking, riveting and swaging dies; indexing and transfer dies.

Other subjects discussed include bending and joining tools, the sub press and its dies, punch and die standards, finding the size of blanks for shells and other drawn and formed work, laying out and making templets and dies, locating holes accurately in die work, making a set of shaving dies, and some hardening principles applied to dies.

The use of press tools is becoming extended into so many lines of manufacture and in those lines assuming such constantly increasing aspects of importance that those in any way connected with design, manufacture or tool department activities cannot afford at the present time to remain uninformed in respect to the details of construction and application of these tools if the product of the plant is of such character as to admit of the utilization of sheet metal working apparatus. To such as these the book is of real value in gaining not only a general knowledge of the subject, but also an understanding of the possibilities of specific applications of the art.

"Our Public Debt" and "Victory and Other Liberty Loan Acts" are the titles of two of a series of booklets being issued by the Bankers Trust Co., New York, for the information of its clients. Other subjects yet to be discussed are the railroad situation, historical and analytical studies of public debts and resources of the principal European nations. The first of the series gives a history of the debt of the United States Government, describing the various bond, certificate and note issues. Details are given of the Liberty bond issues and comparisons are made of the war debts of the chief belligerents in the world war. The second booklet is a compilation of the laws authorizing the recent loans, and contains excerpts from other acts of Congress concerning the public debt. The gist of each paragraph appears in marginal notes.

"Combustion Experiments with North Dakota Lignite" is the subject of technical paper 207, written by Henry Kreisinger, C. E. Augustine and W. C. Harpster, and issued by the Bureau of Mines. The paper gives the results of combustion tests of North Dakota lignite burned in two forms; natural lignite as it comes from the mine and the carbonized residue from gas retorts, The tests were made by burning the fuels at various rates in experimental furnaces and by studying the processes of combustion. The information thus obtained was used in determining some of the general principles on which a successful furnace can be developed for use under power-plant boilers and for house-heating apparatus. A small furnace of this character was designed and tested with promising results. The principles embodied in the design of this special furnace, it is stated, can be applied to boiler furnaces with a promise of success. A copy of the paper may be obtained from the superintendent of documents, Government printing office, Washington.

"Employees' Representation," as it is being carried out at the Steelton, Lebanon and Maryland plants of the Bethlehem Steel Co., according to the well-known plan of the company, is set forth in a booklet, 84 pages, in stiff paper cover, which has just been issued by the company. Halftone portraits of the operating heads and plant managers are shown together with facsimile reproductions of their anouncements to the employees of the inauguration of the plan. Notes are given of the first election of employees' representatives at each plant, together with a diagram showing the increase in votes in the final election over those in the primary and another of the personnel of the entire organization representing the employees at each plant. Reproductions of photographs of each employees' committee are given, followed by a short personal history of each representative; and vignetted portraits are reproduced of each member of the committees, the make-up of which established the democratic and representative character of the plan, epitomized in the sentiment given in conclusion that "When men get together and talk things over with open-minded frankness, much of the ground for dispute and misunderstanding vanishes."

The proceedings of the employment managers' conference at Rochester, N. Y., May 9-11, 1918, are contained in Bulletin 247 of the Bureau of Labor Statistics, United States Department of Labor, Washington, D. C. At this convention, was formed the National Association of Employment Managers and the pamphlet contains its constitution and by-laws and a record of the process of organization. The bulk of the pamphlet, however, is devoted to the speeches on employment problems, in particular, and labor in general. In the appendix appear two sample forms for determining the labor turnover in a plant, a subject which underwent much discussion at the conference. There is also a register of all attending, and the firms they represented. A feature of the convention was the graduation exercises of the 22 who received diplomas from the new Government employment managers' school connected with the University of Rochester.

Iron and Steel Library

The series of books on iron and steel subjects which have been published in the last few years by the McGraw-Hill Book Co., New York, has been rebound as a collection of seven books calculated to be a complete reference library of authorities on the subject of iron and steel. The binding is exceedingly attractive in covers of what is known as flexible Karatol with gold stamping. The book matter itself has already been favorably reviewed, the seven books being as follows: "Metallurgy of Iron and Steel," by Bradley Stoughton; "The Steel Foundry," by John Howe Hall; "Principles of Iron Founding," by Dr. Richard Moldenke; "Blast Furnace Construction," and "Principles, Operation and Products of the Blast Furnace," by the late J. E. Johnson, Jr.; "Metallurgical Calculations," by Prof. Joseph W. Richards; "Refractories and Furnaces," by F. T. Havard.

Metallurgical furnaces for heating ingots for hydraulic presses and steam hammers is the subject of bulletin No. 201 issued by the Fuller Engineering Co., Allentown, Pa. Descriptions and illustrations are of plants utilizing pulverized coal as a fuel for the furnaces.

LABOR SHORTAGE FEARED

Foreigners in Lake Superior Districts Going to Europe—Ore Shipments Fair

DULUTH, June 3.—Iron ore shipments continue heavier than might be expected and with the improved condition in the steel market are likely to still further increase. Up to date, the Oliver Iron Mining Co. is some 20 per cent ahead of last year with the independents only about 10 per cent behind. Of the independents Pickands, Mather & Co. represent the heaviest shippers, and properties in which this concern is interested are fully up to the business of a year ago. The general feeling is that the shipments of the season will be considerably larger than expected when the season opened.

The Zenith mine, on the Vermilion Range, which produces an ore running about 62 per cent dried and 0.04 phosphorus, will be operated after July 1 for open market sales. It has been under lease to the Oliver company for many years, up to 1918 on a 30c. royalty and since then on an 85c. royalty, pending negotiations. The Oliver company evidently did not care to pay the royalty demanded, which was about $1.50 per ton, and so the lease has been taken over by T. F. Cole, R. B. Whitesides, R. M. Sellwood and F. A. Kent. The royalty is 20 per cent of the Lake Erie price on the ore. Messrs. Cole, Whitesides and N. P. Hulst are among the fee owners and the Oliver company itself has a 10 per cent interest in the fee. The mine has produced as high as 700,000 tons in a year, and last year shipped 243,000 tons. For taxation purposes it is estimated to contain about 2,500,000 tons. It is well opened and equipped, and the new company starts in with no development costs behind it.

Cuyuna Range manganiferous properties are making heavy claims on the War Minerals Relief Committee, and two interests, namely George H. Crosby and the Oneida Mines Co. alone, make a combined claim of about $1,000,000. Manganiferous shipments from the range this year, except from open pit properties, will be small.

The Ajax Mine near Biwabik, a revival of an old property, now has some 400,000 tons of ore in sight and expects to produce this year not less than 50,000. A track is now being built to the property. The Oliver Mining Co.'s Kerr mine will produce very heavily this year but will be well toward exhaustion by the close of the season. It is now getting out more than 2,000 tons per day. Last year it shipped over 2,000,000 tons and the year before that nearly 1,600,000.

Probably there soon will be a genuine scarcity of labor on the iron ranges. Men from Italy and Balkan States are leaving for their homes at a rate that indicates a considerable labor withdrawal. They are going for several reasons—many want to find relatives who are lost on account of war, many have estates to be settled, many want to see how their old homes look. That they will stay abroad seems improbable, but they cannot return in time to help much this year. They are of the common labor class that is needed.

Proposed Patent Office Legislation

The Patent Office Society, Washington, is calling attention to the fact that the Patent Office has been unable to obtain adequate appropriations from Congress, that inventors have paid in fees a sum sufficient to have the work of examination done promptly and thoroughly, and that while everybody agrees that this money should be used for that purpose, it has not been so used. Unused fees amount to nearly $8,250,000 the society says.

The Patent Committee of the National Research Council has proposed legislation designed to remedy the situation, as follows: (1) The establishment of a single court of patent appeals to take over the appellate jurisdiction now lodged in the nine independent Circuit Courts of Appeal; (2) The establishment of the Patent Office as a separate institution independent of the Department of the Interior; (3) An increase in the personnel of the Patent Office to enable it to render prompt and efficient service and an increase in the salaries to approximate those paid in outside patent work so that qualified examiners may be kept in the public service; (4) A change in the law relating to damages in infringement suits to answer one of the most common and strongest reproaches against the patent system, namely, that a patent does not ordinarily pay the inventor any money.

Meeting of Material Handling Machinery Manufacturers' Association

The Material Handling Machinery Manufacturers' Association will hold a one-day meeting at the Hotel Astor, New York, on Wednesday, June 11, which will be open to all who are interested in the subject of improvement of terminal and port facilities by means of installation of mechanical apparatus for rapid handling of freight. The association especially invites all manufacturers of cranes, winches and hoists; elevators; gravity and power conveying machinery and apparatus; industrial trucks, tractors and trailers; bulk handling machinery; and all makers of equipment and accessories, such as storage batteries, bearings, ropes for hoists, buckets, electric controllers, etc.

Advertising managers of the companies manufacturing such products are also invited to attend a preliminary conference at the Hotel Astor on the evening of Tuesday, June 10, at 8 o'clock, at which time it is planned to form an advertising council of the Material Handling Machinery Manufacturers' Association.

Among the speakers for the meeting on Wednesday is James H. Collins, special writer, who will tell of the successful results of co-operative promotion and the value to manufacturers of co-operative investigation and educational work. Francis Holley, director of the Bureau of Commercial Economics, will tell how to spread educational propaganda by means of moving pictures. At the afternoon session, a general discussion will take place on ways and means of promoting a more general knowledge of the economies which may be effected through the use of material handling equipment. For the evening, a mass meeting is planned, to which will be invited the members of the Merchants' Association of New York, Chamber of Commerce of New York, the Traffic Club, the Railway Club, city officials of New York and the members of the New York and New Jersey Port and Harbor Commission. An address will be delivered by Theodore Burton, former United States Senator from Ohio, and now chairman of the Merchants' National Bank, New York. Mr. Burton will speak about the tremendous expansion in the use of machinery in the past decade, and will draw upon his experiences as chairman of the United States Waterways Commission, which brought him into contact with the railroad and water transportation problems of the country. Dr. Roy S. McElwee of the Port and Harbors Facilities Commission will give an illustrated lecture at the evening session on American and European wharf equipment.

The committee of the association having the meeting plans in charge are W. J. L. Banham, Otis Elevator Co.; Frederick Stadelman, Wellman-Seaver-Morgan Co.; E. Logan Hill, Heyl & Patterson Co.. Calvin Tomkins, former dock commissioner of New York, president of the association, will preside at the meeting.

Judge Gary Denies Price Fixing

Elbert H. Gary, chairman of the United States Steel Corporation, referring to Washington reports that Attorney General Palmer may consider a new Sherman law suit against steel producers as a result of submission of identical bids on the railroad administration's order for 200,000 tons of steel rails, said:

"Since the meeting of the manufacturers and representatives of the Railway Department held at the Plaza on May 8, at the request of the Director General, there has been no discussion whatever between manufacturers concerning prices nor will there be any unless by request of the government officials, which is not expected."

ESTABLISHED 1855

THE IRON AGE

EDITORS:

A. I. FINDLEY WILLIAM W. MACON GEORGE SMART

CHARLES S. BAUR, *Advertising Manager*

Published Every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

W. H. Taylor, *President and Treasurer* Fritz J. Frank, *Vice-President* George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 243 West 39th Street, New York. H. M. Swetland, *Pres.* Chas. G. Phillips, *Vice-Pres.* W. H. Taylor, *Treas.* A. C. Pearson, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: Equitable Building. Philadelphia: Real Estate Trust Building. Cleveland: Guardian Building. Cincinnati: Mercantile Library Building. Washington: 613 Fifteenth Street, N. W. San Francisco: 320 Market Street.

Subscription Price: United States and Possessions, Mexico, Cuba, Shanghai, $5.00; Canada, $7.50; Foreign, $10.00 per year. Single copy, 20 cents.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879.

Psychology in Price-Making

The Department of Justice at Washington is reported to be giving "serious consideration" to the action of three independent steel companies and three subsidiaries of the United States Steel Corporation in naming $45 on Bessemer rails and $47 for open-hearth rails in their bids on the 200,000 tons recently bought by the Railroad Administration. The intimation is that the Attorney General is considering the matter in view of the charge by Director General Hines that "the action of these six steel companies in making uniform bids was taken under the leadership of the United States Steel Corporation," and that the Sherman act may be invoked.

It is granted even by those members of the official family at Washington who conceive trust-busting and government to be practically synonymous, that the case of the six steel companies is complicated by the fact that the prices submitted in their bids were those indorsed in March "by a Government agency indorsed by the Chief Executive." It can readily be seen, moreover, that the approval of the $45 and $47 figures given by the Industrial Board on March 20, with the accompanying statement that in these prices "a level has been reached below which the public should not expect to buy during the current year," was well stamped on the minds of the controlling officers of the companies bidding for the 200,000-ton order. It is easily conceivable that without any agreement to submit uniform bids—and Chairman Gary has said publicly that no conference on prices has taken place since the meeting with Railroad Administration representatives in New York on May 8—the three independent companies and the Steel Corporation might separately and independently coincide with the Industrial Board's opinion as to the proper minimum for rail prices in 1919. A seventh company took the same view, but decided that it would take no part of the 200,000 tons except at a price $10 per ton above the minimum.

It is evident that a wide field is opened up for Department of Justice activities if the effect of the Industrial Board's indorsement of the March 20 price schedule is to be followed through all its market ramifications. There is an open market to-day for all steel products, yet there is no question of the strong influence upon the minds of the sellers of steel that is every day exerted by the official Government sanction given to the schedule of March 20 when it was promulgated at Washington. Granting that for some producers that schedule means scant profits and therefore they are not strongly tempted to go lower, the fact is that others can make good profits at this level if they can run at two-thirds or three-fourths capacity. All through the market these prices are still spoken of as "regular" or "official" or "standard," and all departures from them are called cuts or concessions. Always the thought is, in the mind of seller or buyer, in referring to a lower price that has been made, not that the market has declined, but that there has been a departure from a still existent market price.

When the Government on the 20th day of March, through its Industrial Board, pointed its index finger at this schedule of iron and steel prices, it put into action a psychological influence that is to-day admittedly a powerful force in sustaining the steel market, in spite of the fact that every week some parts of the schedule are cut from $1 to $3 per ton, and occasionally more. Without concert and without pledges or conferences, the minds of producers of steel are meeting on substantially this level of prices. If such meeting of minds causes the Federal Attorney General to consider opening fire with a broadside of Sherman act suits then assuredly a highly interesting stage has been reached in the evolution of 'trust-busting.' Most interesting of all would be the proposal, of which presently we may hear, to proceed against those who lately, as Government appointees, essayed the thankless task of trying to quicken the country's business out of the numbness and bewilderment into which it fell on the ending of the war.

Clouded Industrial Outlook Abroad

Though the industrial sky in the United States may seem much beclouded because of doubt as to the turns to be taken by labor, there are like conditions abroad which arouse more than mere interest. World-wide labor unrest is not so ominous probably as some reports indicate, but the turbulence among the industrial nations shows little subsidence. In spite of months of effort

abroad, largely through widely distributed literature, to carry home to the worker the basic principle of high per capita production, we now have instances of less unit output with the reduced number of hours of work. Nations which have endured the fifty-one months of warfare may be excused if they still desire to celebrate the cessation of hostilities. At all events, private information from those who have visited Europe in the last several months goes to show that there is not yet a widespread realization of the weight of the aftermath of war. The attitude is perhaps partly due to an expectation that the peace terms will do much to settle affairs in general.

It remains that the per capita burden of war debts among the European countries is staggering and to add to the divergence between conditions in this country and those abroad is the coming period of prohibition in the United States. Unless general opinion here is wrong, the tendency will be for an increased output per worker in this country, while the worker abroad will have the same temptation to squander time and money in the grog shops, meanwhile facing a heavy individual money demand for upkeep of the Government. As if to accentuate the difference is the plea from Director General Greiner of the Cockerill works in Belgium that just as the Allies rendered assistance to Belgium in the war, assistance must still be forthcoming, now that new plants will cost three times as much as those which they replace and little opportunity will be available for recovering an export trade during the construction period. It is no wonder that Europe would like to see something in the way of international commercial compacts.

Not a Profit-Sharing Failure

The recent serious strike at the Willys-Overland plant at Toledo has attracted unusual attention owing to the fact that the so-called 50-50 profit-sharing plan was recently adopted by the company and the distribution of over $400,000 in profit-share checks was made a few weeks ago. The impression has been created in some quarters that the strike was a serious reflection upon the success of the plan, and one manufacturer has written THE IRON AGE saying he is convinced by the experience of the Toledo company that profit sharing is not wanted in this country.

The strike certainly did come as a shock to advocates of profit sharing, but inquiry by THE IRON AGE and examination of the conflicting claims of the officials and the striking employees show that the trouble does not prove anything against the newly adopted system. If anything is established, it is that the inroads which the announcement of the company's profit-sharing and employee representation plans and the distribution of $415,000 in profit-share checks made upon the leadership of the agitators aroused them to see that their influence was waning so rapidly that they must fight or lose control entirely.

We are informed that out of 13,000 men and women who were at work on May 6 more than 7000 remained at their places after the employees represented by the union had walked out; that about 1200 men were present when the strike vote was taken and that less than 900, or only 7 per cent of the employees of the plant, voted to walk out.

It is too early to pass final judgment upon the success of the various plans which have been adopted by the Toledo company, but the weight of the evidence up to the present time is in their favor. It is doubtless true in this case, as is so often the fact when reform measures are adopted, that the proponents expect too great results and are disappointed, despite the fact that real progress has been made, while at the same time opponents are quick to exaggerate any events that may be interpreted as unfavorable to the new measures.

High Fuel Ratio for Pig Iron

The annual statistical volume of the American Iron and Steel Institute which has just come from the press contains little fresh information, but puts in form convenient for reference the production statistics previously furnished through a series of bulletins, the substance of which was printed in the trade press. One item not given in the bulletins was awaited with considerable interest—the materials consumed by blast furnaces in 1917. The report just published gives the full information. Suspicions are confirmed that the blast furnaces consumed an abnormal quantity of coke in 1917. It appeared in 1917 that the furnaces, while complaining of coke shortage, were not making even as much pig iron as the supply of coke actually available would indicate. In 1918 this apparent discrepancy was still greater.

While the production of pig iron decreased from 39,434,797 tons in 1916 to 38,621,216 tons in 1917, or by 2.06 per cent, the consumption of coke increased from 44,431,905 tons to 44,493,316 tons, or by 0.14 per cent. To be precise, the production of bituminous pig iron (made with coke and raw bituminous coal) should be compared with the coke consumed, plus an allowance for the small quantity of raw bituminous coal used—about 100,000 tons a year. Adding two-thirds of this coal to the coke, it is seen that the coke consumption per ton of pig iron thus made averaged 2291.6 pounds for 1916 and 2354.1 pounds for 1917, showing an increase of 2.72 per cent.

The complaints of poor quality coke were much more pronounced in 1918 than in 1917, and there was more pig iron output lost last year through furnaces operating irregularly, sometimes even banking, whereby they consumed some coke without producing any pig iron. There is no doubt that the 1918 statistics when compiled will show a much larger coke consumption per ton of pig iron than even that of 1917. The increased coke consumption of 1917 was not due to change in the character of the ferrous material smelted, since the consumption of ore decreased from 1.856 ton per ton of pig iron in 1916 to 1.846 ton in 1917, while the consumption of scrap, scale, etc., increased from 0.111 ton to 0.126 ton. Other things being equal, this should have operated to decrease the coke consumption. The consumption of limestone per ton of pig iron increased from 1041.3 pounds in 1916 to 1078.6 pounds in 1917, the increase being evidently due to increased ash that had to be slagged off, rather than

increased impurities in the iron-bearing materials charged.

An interesting item in the report is that on page 45 the 1917 production of iron sheets and plates is given at 20,971 gross tons, while the exports of iron sheets and plates as reported by the Government are shown on page 74 to have been 62,238 gross tons.

The difficulty encountered in endeavoring to compile price statistics from a variety of sources is illustrated by the fact that the average price of foundry coke in August, 1917, is indicated as eight cents above the furnace coke average, while for the next month the spread between the two grades is indicated as $2.15.

Keeping Alive Patent Claims

The Commissioner of Patents has undertaken the elimination from patent practice, so far as it lies within his power under existing laws, of the custom of keeping alive applications filed in the Patent Office and of delaying year after year the taking out of the patent. The custom is an old one. Those who employ it are actuated by various motives. One is that a longer protection for the invention is secured; another that the descriptive text and drawings do not reach so soon the eyes of competitors; and a third reason may be that the applicant is not wholly certain of the validity of his claims, possibly, for example, in the knowledge that interference exists in some invention long forgotten until revealed in the search of the records in connection with the application. In such a case, should a rival manufacturer undertake to employ the same idea, he could be handled more advantageously by the warning that a patent has been applied for than by giving him a description of just what the patent consists of. This studied policy of delay is legal; but it is maintained, not contemplated by the law.

The Commissioner of Patents has established a new system under which at the end of three years from the date of the original filing of an application the inventor is notified that it has been put on a preferred list, and he is requested to take prompt action to carry through his case to the issued patent stage. As a matter of fact, the inventor would still have plenty of delay coming to him, for, according to the experience of the patent lawyers, he could still drag out his case for something more than three years longer by availing himself of privileges afforded by the statutes. Very likely in certain cases the total period thus obtained is none too long. But eventually under the new rule of the Patent Office, if the patent is not taken out, sufficient time will elapse to give the commissioner power to take negative action on the application, and the invention will be released for any one to use.

The method employed in keeping alive an application is to file a new claim for the invention within each of the succeeding intervals prescribed by the law, which is easily done, for to formulate a perfunctory claim is no difficult matter. By this means applications have been kept alive as long as 20 years, which, with the 17 years' life of the actual patent, affords protection for 37 years instead of the usual period.

This phase of the American patent laws is somewhat closely related to the compulsory working of patents, which has often been urged for the United States on various grounds. One of these is that practically every foreign country with which this nation has patent relations has a compulsory working clause in its patent laws. Foreigners protect their inventions in the United States so that none may work them , while they themselves work them at home and send the products into this and other countries to the detriment of their American competitors. There have been many cases of this kind, and foreigners have also availed themselves of the opportunity to keep alive their claims by putting off the taking out of patents, which is impossible under the laws of their home countries. American owners of patents in foreign countries enjoy no such privileges. Patents must be taken out within a stated period, and inventions must be worked, else protection is withdrawn.

The American patent laws need an overhauling; such is the practically unanimous opinion of those who come in touch with their working. But Congress is not eager to undertake a revision, and prefers to consider existing statutes good enough, at any rate for the immediate future. The task would be no easy one, for there are many theories and many practical sides to be considered before a satisfactory code could be evolved, and perhaps the situation would be made worse instead of better. Even an important amendment, such as one aimed to correct the condition under discussion would not easily be brought to the serious attention of Congress, for it might precipitate consideration of the whole subject. Consequently whatever correction is undertaken apparently must come from the Patent Office itself by the use of whatever methods existing laws permit.

Save Daylight Saving

Manufacturers have a deep interest in the daylight saving law, which is threatened with repeal by Congress. The direct financial saving to industry is worth thinking about, and there is the proved national saving of a million tons of coal last year. But to thousands of employers these things are secondary to the benefits which accrue to the workers from the additional hour of sunlight at the end of the day, giving them ample daylight in which to till their gardens and enjoy their sports in the out-of-doors. Healthful recreation is conducive to efficiency in shop and factory.

The war garden, still so-called, has become an important institution. Hundreds of firms are furnishing the land which their employees farm after working hours and at week ends. To most of the latter the garden is a real recreation as well as a means of keeping down the cost of living. The average man likes growing things, and particularly those which belong to him. The owner, too, has something of the same pride in these crops that he would have were they the result of his own toil. Neighbor factories with gardens become rivals in the same way that shop teams compete in sports. It is such things as these that wear down the barriers between employer and employee and stimulate co-operation, shop spirit, morale. There is nothing paternal about them.

It is straight friendliness and good business. Greater permanency of employment results from the community gardens, and employers who provide them are able to secure the best types of workers. A man who will devote his leisure time to a garden is usually a good sort to have on the payroll, and once attached to a garden plot the chance of his becoming restless and leaving for other employment is not so great. According to the agricultural experts, the money value in products of war gardens was millions of dollars greater last year because of the extra hour of daylight devoted to cultivation. This additional value went into the pockets of the men who raised the crops. The men know it, and join with the employers in resenting any attempt to return to the old division of the summer hours. To abolish daylight saving would be a step backward for industry.

Farm Products Advance More Than Steel

A Western manufacturer of steel roofing has prepared the following statement graphically showing the enhancement of prices of farm products and the much greater advance in such products than has taken place in steel:

Before the war it took
6 bushels of corn to buy.....1 square of roofing
Today it takes only
4½ bushels of corn to buy.....1 square of roofing
Before the war it took
60 lb. of live hog weight to buy.....1 square of roofing
Today it takes only
37 lb. of live hog weight to buy.....1 square of roofing
Before the war it took
5 bushels of wheat to buy.....1 square of roofing
Today it takes only
3 bushels of wheat to buy.....1 square of roofing

Scullin Steel Co. to Erect Rolling Mill

The Scullin Steel Co., St. Louis, has started work on installing a rolling mill at the east end of its steel casting plant on Knox Avenue. Its six 30-ton open-hearth furnaces have been idle since it completed its munitions steel contracts. The company has made a survey of the possible demand for finished rolled steel and the result is the decision to enter into the manufacture of rolled steel as well as steel castings, the latter having been its chief business.

The plant will include both structural and bar mills. Steel will be cast in 12 x 12-in. ingots. These reheated will be rolled into billets. Continuous heating furnaces, oil-fired, will be employed. Structural shapes and bars will be rolled on a 22-in. mill of four stands, three rolls high. A hot bed, hot saw and straightener are of course included. A five-stand 12-in. mill preceded by a two-stand 16-in. rougher will roll the smaller merchant bars from reheated billets. This mill will also have its hot bed and finishing machinery, all of which will be motor driven.

The 22-in. mill building will have a 76-ft. span and a length of 487.5 ft. The 12-in. mill building is 75 ft. 6 in. x 500 ft. The two are separated by 60 ft. to be utilized for the billet storage, etc. The plant will have a capacity of 9000 to 10,000 tons of ingots per month. Perin & Marshall, New York, are the consulting engineers.

Pollak Steel Co. to Roll Shapes

The Pollak Steel Co. has decided on extensions to its plants in Cincinnati and South Chicago. At the latter plant the drop forging equipment will be extended. At Cincinnati a rolling mill is to be installed for structural shapes and bars, having in mind the market afforded by the automobile and agricultural machinery interests. The structural plant is expected to have a capacity of 8000 to 10,000 tons per month, and the company is planning to have the new works in operation by Jan. 1, 1920.

CONTENTS

New Features in Heat Treating Plant—Methods Adopted by Parish & Bingham Co., Cleveland, in Annealing and Pickling Rooms..... 1493
Gantry Portal Crane for Yard Work..... 1496
The British Electric Steel Industry..... 1497
Foundry Convention Plans..... 1498
Production of Albany Molding Sand..... 1499
New Type Electric Furnace..... 1502
Sweden Needs American Machinery..... 1503
High Speed Milling Machine..... 1504
Portable Drill with Taper Socket..... 1504
Iron Ore Analyses..... 1504
Bridgeport Industrial Relations Plan..... 1505
Concrete Houses for Workmen..... 1506
Chromium in Steel..... 1507
Heat Treating Tool Steel..... 1508
How the Germans Destroyed Belgian Plants—Experiences in the Cockerill Works, Seraing, Belgium..... 1514
Railroad Boiler Makers Meet..... 1516
Thompson Coal Properties to Be Sold..... 1516
Grinder for Drills..... 1517
Record of the Lincoln Motor Co..... 1517
Transfer and Promotion of Employees..... 1518
Labor Department Keeps Up Propaganda on Continued High Prices..... 1519
Iron and Steel Exports Show Increase..... 1520
Drop Forge Men to Meet June 11 to 14..... 1521
Little Governmental Meddling Expected..... 1522
British Steel Output in 1918..... 1523
Coke Production Increasing..... 1523
Canadian Strikes..... 1523
Trade Balance in Favor of Philippines..... 1523
Labor Situation:
Puddlers' Demand—Advance for Molders—Welfare Work in Iron Industry—To Reward Workers for Thrift—Safety Work Improving Shop Relations—Opportunity Monographs—Helping Employees Buy Homes in Detroit—Strike Taken to Court—In the Labor World..... 1524-25
French Method of Making Ferrocerium in Sticks for Pyrophoric Use..... 1527
Pneumatic Chucks for Tires..... 1527
Book Reviews..... 1528
Labor Shortage Feared..... 1529
Proposed Patent Office Legislation..... 1529
Meeting of Material Handling Manufacturers' Association..... 1529
Judge Gary Denies Price Fixing..... 1529
Editorials:
Psychology in Price-Making—Clouded Industrial Outlook Abroad—Not a Profit-Sharing Failure—High Fuel Ratio for Pig Iron—Keeping Alive Patent Claims—Save Daylight Saving..... 1530-32
Farm Products Advance More Than Steel..... 1533
Scullin Steel Co. to Erect Rolling Mill..... 1533
Pollak Steel Co. to Roll Shapes..... 1533
Iron and Steel Markets..... 1534
Prices Finished Iron and Steel f.o.b. Pittsburgh..... 1546
Pig Iron Production for May..... 1548
Blast Furnace Notes..... 1549
Personal..... 1550
Obituary..... 1551
Illinois Steel Co. Sales Department Reorganization..... 1552
Donner Steel Co. Buys Tonawanda Stacks..... 1552
Falcon Steel Co. Organized..... 1552
To Sell Iron from Port Henry Furnace..... 1552
Current Metal Prices..... 1562

Strikers Weakening

The report comes from the New York office of the National Founders' Association that the strikes of the molders through the East are weakening, as substitutes are gradually being placed in the foundries. Workmen are still out in the following cities of New York: Syracuse, Rochester, Utica, Geneva; also in Worcester and Holyoke, Mass., and in Paterson, N. J. The demands are for the 8-hr. day with minimum wage of $5.80 daily.

Stock of Griffin Wheel Co. Not Yet Transferred

It is officially stated that the American Steel Foundries has acquired control of the Griffin Wheel Co., but will not assume full charge of the property until about July 1. That the American Steel Foundries would take over the wheel company has been persistently reported for months. It is now authoritatively said that while the purchase is assured, actual transfer of the stock will not be effected until about the first of July.

Iron and Steel Markets

CONTINUED BETTERMENT

Export Demand Grows with Domestic Buying

Pig Iron Production Falls Off Further, But Market Is More Active

The activity in the steel market continues in an encouraging way, without broadening to any marked degree. Operations are on a slightly increased scale. Some phases have been overrated, particularly the amount of third quarter and second half buying, which is quite moderate. Price irregularities continue, but the schedule of March 20 holds its place as the market standard. The concessions are in sheets, hot rolled strips, steel bands and some other of the lighter products. Occasionally an extra is waived or reduced.

In an effort to bring buyers into the market, reports of an expected advance of $2 per ton in certain finished products have found circulation, but the maneuver seems to have excited little response. Consumers do not miss the fact that the improvement must meet the test of the summer months.

Export demand grows and the business is more dependable, in contrast with the mass of duplicated inquiries from which there was relatively small result in a number of preceding weeks. There are signs that foreign buyers who were waiting to get their cue from the action of domestic consumers are now coming forward.

The blowing out of blast furnaces keeps up, and pig iron producers are beginning to point out the possibility of overdoing curtailment, though that point is not yet in sight. Pig iron output in May was 2,108,056 tons, or 68,002 tons a day, against 2,478,218 tons in April, or 82,607 tons a day. The May rate was the lowest since March, 1915, when the depression of the early months of the war was still marked.

Last month showed a net loss of 17 furnaces, there being only 195 in blast on June 1, with capacity of 68,100 tons a day, while 212 were active on May 1, producing at the rate of 75,860 tons a day.

Japan is in the market for another 10,000 ton lot of rails. The last 10,000 tons of the 50,000 recently bought went at $47 for the open-hearth product, indicating that the $10 spread over the domestic price for export did not long obtain. Export business in sheets has been good in the Pittsburgh district.

On about 350 tons of plates for 12 locomotives for Korea and 10 for South Africa, and again chargeable to export conditions, a price of 2.50c., Pittsburgh, was done, $3 per ton below the general market.

Private orders for ships and several extensive apartment house building projects, added to several thousand tons of industrial plant buildings in the East and a long list of structural work in the Central West, promise early expansion of activity in shapes and plates. Not much railroad bridge work is under consideration.

Some response to the need of finishing capacity to balance the present excess of semifinished steel capacity is shown in two bar and structural mills put under construction, one in South Chicago and the other at St. Louis. Each is rated at 10,000 tons of rolled steel per month.

In some markets there are unmistakable signs of improvement in pig iron. At Buffalo about 50,000 tons has been sold, including two round lots of basic for New England. At Chicago two second-half contracts were for 12,000 tons of foundry and 8,000 tons of malleable. Cleveland reports fair-sized sales of foundry grades, with inquiries increasing both as to number and tonnages. Some Southern producers are offering iron at Cleveland and other points in the North to meet the delivered prices quoted by Northern furnaces, and competition between sections is wiping out the uniform prices at furnace. A Virginia maker has reduced prices $1 a ton and has booked 12,000 tons. In eastern Pennsylvania low phosphorus pig iron is not in demand, but it could be had at $5 to $6 below the so-called regular prices.

Of interest in the ferromanganese market is the offer of British makers to meet the prices recently named on the domestic alloy.

Without much actual buying by consumers, scrap has taken an upward turn and prices are firmer in all markets, being generally quoted 50c to $1 a ton higher than a week ago. At Buffalo a sale of 10,000 tons of No. 1 heavy melting steel was made at $16.50 to $17. A Michigan scrap dealer bought 33,000 tons of ingots and forgings from the War Department at slightly over $16. Many dealers are storing scrap in the expectation of higher prices.

Lake Superior iron ore shipments up to June 1 were 8,301,550 tons, as against 9,028,101 tons in the same period last year. The Steel Corporation has been bringing down the bulk of the ore thus far this season, and the movement to independent consumers is just now getting under way.

Pittsburgh

PITTSBURGH, June 3—(*By Wire*).

Reports received this week from the leading local steel companies are all of a very optimistic nature, and seem to indicate strongly that the tide in the steel trade has turned for the better, and that the improvement in business is not in sentiment, but also in actual orders being placed with the mills, mostly for prompt shipment, indicating that the material is needed for quick use.

There are some in the trade who believe that foreign buying will prove to be the forerunner of a much larger domestic demand in the near future. References are made to 1915, when the foreign war demand for steel started actively, and now that peace is near at hand, a heavy export business in steel is looked for for reconstruction work in the countries devastated by the war. Representatives of engineering firms in the Pittsburgh district have gone abroad lately on missions that involve either entire new steel construction or repair work that in time will produce some demand for steel on this country. In some quarters there is a tendency to overrate the improvement in the steel business, but the fact remains that the steel mills are entering more

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	June 3, 1919	May 27, 1919	May 6, 1919	June 4, 1918
No. 2 X, Philadelphia‡	$29.50	$29.50	$31.90	$34.25
No. 2, Valley furnace†	26.75	26.75	26.75	33.00
No. 2, Southern, Cincin†	28.50	29.35	30.35	35.90
No. 2, Birmingham, Ala†	25.75	26.75	26.75	33.00
No. 2, furnace, Chicago*	26.75	26.75	26.75	33.00
Basic, deliv., eastern Pa	29.65	29.65	29.65	32.75
Basic, Valley furnace	25.75	25.75	25.75	32.00
Bessemer, Pittsburgh	29.35	29.35	29.35	36.15
Malleable, Chicago*	27.25	27.25	27.25	33.50
Malleable, Valley	27.25	27.25	27.25	33.50
Gray forge, Pittsburgh	27.15	27.15	27.15	32.75
L. S. charcoal, Chicago	38.85	38.85	38.85	37.50
Rails, Billets, Etc.,				
Per Gross Ton:				
Bess. rails, heavy, at mill	45.00	45.00	45.00	55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	38.50	38.50	38.50	47.50
O.-h. billets, Pittsburgh	38.50	38.50	38.50	47.50
O.-h. sheet bars, P'gh	42.00	42.00	42.00	51.00
Forging billets, base, P'gh.	51.00	51.00	51.00	60.00
O.-h. billets, Phila	42.50	42.50	42.50	50.50
Wire rods, Pittsburgh	52.00	52.00	52.00	57.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.595	2.595	2.595	3.685
Iron bars, Pittsburgh	2.35	2.35	2.35	3.50
Iron bars, Chicago	2.50	2.50	2.50	3.50
Steel bars, Pittsburgh	2.35	2.35	2.35	2.90
Steel bars, New York	2.62	2.62	2.62	3.095
Tank plates, Pittsburgh	2.65	2.65	2.65	3.25
Tank plates, New York	2.92	2.92	2.92	3.445
Beams, etc., Pittsburgh	2.45	2.45	2.45	3.00
Beams, etc., New York	2.72	2.72	2.72	3.195
Skelp, grooved steel, P'gh.	2.45	2.45	2.45	2.90
Skelp, sheared steel, P'gh.	2.65	2.65	2.65	3.25
Steel hoops, Pittsburgh	3.05	3.05	3.05	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire,	June 3, 1919	May 27, 1919	May 6, 1919	June 4, 1918
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh	4.35	4.35	4.35	5.00
Sheets, galv., No. 28, P'gh.	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh	3.25	3.25	3.25	3.50
Cut nails, Pittsburgh	4.25	4.25	4.25	4.00
Fence wire, base, P'gh	3.00	3.00	3.00	3.25
Barb wire, galv., P'gh	4.10	4.10	4.10	4.35
Old Material, Per Gross Ton:				
Carwheels, Chicago	$20.50	$20.50	$21.00	$29.00
Carwheels, Philadelphia	20.00	20.00	22.00	29.00
Heavy steel scrap, P'gh	**16.00**	15.50	14.50	28.50
Heavy steel scrap, Phila	**15.50**	15.00	15.00	29.00
Heavy steel scrap, Ch'go	15.50	15.50	15.75	29.00
No. 1 cast, Pittsburgh	17.00	17.00	17.00	28.50
No. 1 cast, Philadelphia	**22.00**	21.50	21.50	29.00
No. 1 cast, Ch'go, net ton	19.50	19.50	20.00	27.00
No. 1 RR. wrot., Phila	21.00	21.00	21.00	34.00
No. 1 RR. wrot., Ch'go, net	15.75	15.75	15.50	29.75
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$4.00	$4.00	$3.50	$6.00
Furnace coke, future	4.00	4.00	4.00	6.00
Foundry coke, prompt	4.50	4.50	4.00	7.00
Foundry coke, future	5.00	5.00	4.50	7.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	16.75	16.75	15.50	23.50
Electrolytic copper, N. Y.	16.50	16.50	15.25	23.50
Spelter, St. Louis	6.45	6.25	5.92½	7.25
Spelter, New York	6.50	6.60	6.27½	7.50
Lead, St. Louis	4.95	5.00	4.60	6.92½
Lead, New York	5.20	5.25	4.85	7.05
Tin, New York	72.50	72.50	72.50	90.00
Antimony (Asiatic) N. Y.	8.37½	8.25	6.62½	12.25
Tin plate, 100-lb. box, P'gh	$7.00	$7.00	$7.00	$7.75

orders at this time than in any period since the armistice was signed. Reports are in circulation that two or three leading steel interests are thinking of advancing prices on steel about $2 per ton, but this may be only propaganda circulated for the purpose of causing buyers to take hold and place orders more freely. However, there is a movement in the wire trade to advance wire nails about 25c per keg, and this may possibly be done in the near future. The most active items in the finished steel market are, in the order named, wire products, tubular goods, and then sheets. There is also a much larger demand reported for steel bars and several other products.

Very little is heard any more of any general reduction in prices. The fact remains that there are still some dips in the market, but these are not very serious. There is some shading in blue annealed sheets, also in hot rolled strips, steel bands, in black and galvanized sheets and on some of the lighter steel products. However, it is claimed that fully 80 to 90 per cent of the orders coming to the mills today are being placed at full regular prices. Some mills are not strongly urging customers to cover ahead, but would prefer to see them place orders for material as they need it. Tin plate is still lagging in demand, and it is now believed that the tin plate business this year will not be over 60 to 65 per cent of last year, which was a record year in this trade. Predictions are still made of a shortage in labor this fall, because of the large exodus of foreigners to their native countries.

Pig Iron.—A meeting of the Cleveland district furnace operators who are members of the American Pig Iron Association was held here on Wednesday, May 28, but no important action was taken. Several members predicted there would be a shortage of pig iron in this country by August, but this was by no means the general sentiment of those present. There is an active export inquiry for pig iron, but no very large lots are involved. We note one sale of 500 tons of Bessemer to a domestic buyer, and another of 600 tons of Bessemer for export, both reported at the full price of $27.95 at Valley furnace. We also note a sale of 1500 tons of No. 2 foundry iron for last half of the year at the full price of $26.75, and 600 tons of malleable for third quarter at the regular price of $27.25, Valley furnace. The demand for foundry iron is fairly active, and one furnace interest that has been trying to accumulate iron at one of its stacks, which it intends to blow out in the near future, has been unable to do so, and in fact has taken some iron in stock in order to take care of its customers, who now seem anxious to cover, at least over third quarter. There is still some resale basic and Bessemer iron in this market, and two sales are noted of basic of 500 tons each at about $1 per ton under the regular market. Very soon all the resale iron will be cleaned up and then buyers will have to negotiate with the furnaces, and probably will pay full prices. The Carnegie Steel Co. is now operating more blast furnaces than a month ago, having on June 1 33 stacks in blast and 26 idle. Claire Furnace of E. W. Mudge & Co. will likely go out this week for relining and repairs. Prices on pig iron are stronger than they were two or three weeks ago, and we repeat last week's prices as follows:

Basic pig iron, $25.75; Bessemer, $27.95; gray forge, $25.75; No. 2 foundry, $26.75; No. 3 foundry, $26.25, and malleable, $27.25; all per gross ton at Valley furnaces, the freight rate for delivery in the Cleveland and Pittsburgh districts being $1.40 per ton.

Ferroalloys.—Nothing is being done in alloys, except in small lots of resale material, and these are going at very low prices. One sale of ferromanganese is reported at $93 delivered, but on the other hand some concerns that could spare ferromanganese are holding it for $105 and $110. Reports are going of a lot of about 100 tons of resale 50 per cent ferrosilicon, going at close to $80 delivered.

We quote 78 to 82 per cent resale ferromanganese at $95 to $105, delivered, with a reduction of about $2 per unit for lower percentages. We quote resale 50 per cent ferrosilicon at $80 to $85 and resale 18 to 22 per cent spiegeleisen at $33 to $35, delivered. Prices on Bessemer ferrosilicon are: 9 per

cent, $43; 10 per cent, $45; 11 per cent, $48; 12 per cent, $51. We quote 6 per cent silvery iron, $36.75; 7 per cent, 37.75; 8 per cent, $40.25; 9 per cent, $42.25, and 10 per cent, $44.75, but some sellers not in Jackson County have been quoting on a basis of $35 for 6 per cent. About $3 per gross ton advance is charged for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Plates.—The fact that the Government has lately released a large number of cars which are now being built by the steel car companies has brought some business to the plate mills, which were very badly in need of it. As yet, the Government has not given any signs of placing orders for cars, and the steel car companies are still holding thousands of cars, for which the Government has failed to furnish stencil numbers and names of roads for which they were built. Local plate mills are operating to probably 60 per cent of capacity, but some smaller mills are running at a less rate. There is an active export inquiry for plates, on which slightly lower prices are named, in some cases, than on domestic orders. We quote ¼-in. and heavier sheared plates at 2.65c mill, Pittsburgh, for domestic trade.

Billets and Sheet Bars.—While there is not much more inquiry for billets and sheet bars, steel mills report that the sheet and tin plate mills and also other finishing mills are specifying for larger quantities of steel than at any time for some months. A Youngstown, Ohio, steel interest reports a sale of 3000 tons of sheet bars for third quarter at the full price of $42 at mill. Operations among the steel mills are better, and are averaging from 60 to 65 per cent, while the Carnegie Steel Co. is reported to be operating its various steel plants at close to 75 per cent of capacity. Prices on steel are firmer, and it is not likely that as large concessions would be offered now as could have been obtained a month or more ago. Several producers of billets and sheet bars intimate prices may be higher in the near future.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $38.50, 2 x 2 in. billets at $42; sheet bars, $42; slabs, $41, and forging billets $51 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Structural Material.—An item of interest in this trade is that the McClintic-Marshall Co. has taken about 14,000 tons of fabricated steel for new mill buildings for the new open-hearth steel plant now being built by the Weirton Steel Co. at Weirton, W. Va. This is the largest domestic order for fabricated steel placed here in a long time and it is said competition for it among the various fabricators was very keen. The McClintic-Marshall Co. has also taken 500 tons for a new building for the Cleveland Worsted Mills Co., Ravenna, Ohio. Fabricators report the inquiry much more active, and a large amount of new work is being figured on, some of which no doubt will be placed. A good deal of local work is coming up, and a vote on a bond issue of $22,000,000 will be taken in this city shortly for four or five new steel bridges across the Allegheny and Monongahela Rivers, also a tunnel under Mount Washington, and various other projects. If the vote is favorable and the proposals go through, they will require a very large amount of steel.

We quote beams and channels up to 15 in. at 2.45c. at mill, Pittsburgh.

Sheets.—Some very large business in sheets for automobile purposes is about to be closed, and much more is in prospect. This week the allotment of the General Motors Co. contracts for steel are to be placed, and the leading local interest will furnish practically all the sheets embraced in the contracts. The Ford Motor Co. is said to be fairly well fixed with sheets up to about August, but is expected to come in the market late this month, or early in July, for a full requirement. The Willys-Overland Co., Toledo, was just about ready to figure on its sheets and other steel over the year, when its strike started and the company has not done anything since. There has been an increase in demand for all grades of sheets, especially electrical and high finish sheets for automobile purposes, and on these grades mills are entering heavy orders. There is some unevenness in prices on blue annealed sheets, caused by the fact that some mills classed as plate mills which roll blue annealed No. 8 and lighter are quoting the plate price on these, plus the extras, which makes Nos. 8 and 9 blue annealed sheets about 3.05 at mill, the regular price on these gages being 3.50c. at mill. The practice has been followed by two or three nearby mills, and also by a Chicago interest. There is also some shading in prices on galvanized sheets caused by the fact that a leading Western mill that stopped making galvanized sheets several days ago when spelter was so high has again started making these, and is buying its way back into the market, by naming low prices on its galvanized sheets. Reports received by the Association of Sheet Manufacturers on quotations made in May show that 80 to 90 per cent of these were practically full prices, but there is still some cutting going on in certain districts. Export inquiry for sheets is heavy, and one leading interest reports that for some time it has been booking close to 1000 tons of sheets per day, largely for Japan, and also for India, South America and other foreign countries. The American Sheet & Tin Plate Co. and the independent sheet mills are now operating to 70 to 75 per cent of capacity, a higher rate than has obtained for sometime. Regular prices on sheets, which are not always minimum, are given on page 1546.

Iron and Steel Pipe.—Leading mills making oil country goods now report they are filled up on this product for two to three months, and would not be able to take on any large gas or oil lines and make the delivery in time to lay the lines this year. Some very heavy inquiries for line pipe are in the market. The Atlantic Gulf Corporation is inquiring for about 35 miles of 8 and 10-in. pipe, the Texas Co. for 30 to 40 miles of 8-in., the same quantity of 4 and 6-in. and 20 miles of 10 and 12-in. Another active inquiry in the market is that of the Lone Star Gas Co., referred to briefly last week, which consists of 150 miles of 12-in., 40 miles of 10-in., 15 miles of 8-in. and 15 miles of 6-in., all to be plain end pipe. Some time ago the Equitable Gas Co., a local interest, came in the market for 10,000 to 12,000 tons of casing, but the order was not placed and nothing has been heard of it recently. On lap-weld pipe and oil country goods the demand is heavy enough to take the output of the mills for some months, while the demand for butt-weld pipe is also getting heavier, and as a whole the pipe market is probably the most active in demand of any of the finished steel products. Prices are well held, but on some large lines placed lately have been shaded. Discounts on iron and steel pipe are given on page 1546.

Tin Plate.—There is some little betterment in the new demand for tin plate, but it is still lagging, and is very far short of what it should be at this season of the year. Tin plate mills are operating to about 50 per cent of capacity, but state there are strong indications of a heavier demand in the near future. The pea crop this year will be larger than expected, especially in Wisconsin, while the tomato crop will likely be larger than last year. However, the general pack of fruit and vegetables this year will probably not be more than 60 per cent of what it was last year. There is some export inquiry for tin plate, and some fair-sized lots, ranging from 1000 up to 5000 boxes, are being sold steadily for export. Prices on stock items are still being shaded from 50c. to 75c. per box. We quote production tin plate at $7 per base box, f.o.b. Pittsburgh, for delivery over the remainder of this year, the price to be readjusted on any unshipped portions of contracts, should there be a decline in the open market price. Mills report the demand for tin plate heavy, indicating a more active building condition and prices are given on page 1546.

Wire Rods.—Both domestic and export inquiry is more active than for some time, one export inquiry for 2000 tons of soft rods and high-carbon rods is now in the market, and on sales of export rods, mills get full domestic prices, except Canada, where sales are sometimes made at less than domestic prices. Two local mills report they are comfortably fixed on rods over the next two or three months. We note domestic sales of 1500 to 2000 tons of soft rods, and 500 tons of high-carbon rods at reported regular prices, which are given on page 1546.

Wire Products.—May was by far the best month in specifications and shipments by the wire mills since the armistice was signed. One leading mill reports its specifications and new orders in May were 86 per cent of its rated capacity. There is a movement under way in the wire trade to advance prices on wire and wire nails about $5 per ton, and this may be put in effect in a short time. The present price of plain wire is 3.25c., and nails are $3.50 base, which leaves only 25c. for drawing wire into nails, supplying the keg and other costs, and makers of wire nails say they should have an advance of at least 25c. per keg over the present price to allow even a fair profit. Export inquiry for wire and wire nails is heavy, and fairly large orders are being taken for shipment to India, Japan, South America and other countries. Wire mills are well filled up for some little time ahead, and prices are reported as being firmly held by the large mills on wire and bright nails, but coated nails are still being shaded about 10c. per keg, or more. Prices on wire products are given in detail on page 1546.

Steel Rails.—So far as known no further contracts for steel rails have been placed by the Government, but it is claimed the Government will have to buy for this year delivery well up to 1,000,000 tons to cover actual needs. A Western road is reported to have placed 3000 tons of standard section open-hearth rails at the regular price of $47 at mill. We quote Bessemer standard sections at $45 and open hearth at $47 at mill, Pittsburgh.

We quote 30 to 45-lb. rails at 2.45c.; 16 to 20-lb., 2.49½c., and 12-lb. at 2.53½c., in carload and larger lots f.o.b. Pittsburgh.

Hot-Rolled Strip Steel.—It is pretty well established that some mills that ordinarily roll only hoops and bands are selling hot-steel strips at the hoop and band price of 3.05c. The demand is reported only fair, and there is a good deal of competition on the limited amount of business that is being placed. The regular price on hot-rolled strip steel is 3.30c. per lb. f.o.b. Pittsburgh, but frequent sales have been made at the hoop and band price of 3.05c., Pittsburgh.

Cold-Rolled Strip Steel.—The demand is reported a little better, but is still mostly for small lots to cover actual needs and for prompt delivery. There is some unevenness in prices, but it is claimed that this is only in a few special cases where the mill will agree to absorb part or all of the freight.

We quote cold-rolled strip steel at $5.65 base per 100 lb., f.o.b. Pittsburgh, for 1½-in. and wider, 0.100 in. and thicker hard tempered in coils 0.20 carbon and under. Boxing charge 25c. per 100 lb.

Nuts and Bolts.—Several makers report a slightly better demand, but jobbers and consumers are still buying only in small lots to cover actual needs. There is some shading in prices done mostly by makers agreeing to absorb part or all of the freight, while in other cases straight additions of 2½ to 5 per cent regular discounts are made. Discounts on nuts and bolts, which are not always minimum of the market, are given on page 1546.

Shafting and Screwstock.—The general demand is larger, and from the automobile trade is much heavier than in a long time. The demand is now said to represent close to 50 per cent of normal capacity, and it is claimed regular discounts are being firmly held.

Hoops and Bands.—Several mills report the demand for hoops and bands has been more active now than at any time for five or six months, and one local hoop and band mill that was down for several weeks for lack of orders is again in partial operation. The regular price on hoops and bands is 3.05c., Pittsburgh, plus usual extras.

Spikes.—Several railroads came into the market about two weeks ago with fair-sized inquiries for spikes, but later reported they had been able to secure them from other roads and would not buy for the present. The general inquiry for spikes is very light.

We quote standard spikes, 9/16 x 4½ in., and also small spikes, $3.35 base per 100 lb. in carload lots of 200 kegs or more plus usual extras. Boat and barge spikes, $3.85 per 100 lb. in carload lots of 200 kegs or more.

Iron and Steel Bars.—Some few contracts for steel bars have been placed for delivery over last half of the year, but in most cases only for third quarter, by implement makers and other consumers. It is said there was no shading in prices on these contracts, nor was any guarantee given against decline. It is also stated that new orders are being placed more freely and for larger quantities for iron and steel bars than for some time. Mills rolling iron or steel bars are still operating to about 50 per cent of capacity.

We quote soft steel bars rolled from billetes at 2.35c.; from old steel rails, 2.45c. Bar iron is quoted at 2.35c. for Eastern shipment and 2.55c. for Western shipment.

Boiler Tubes.—Makers report a slight increase in the new demand for locomotive and merchant tubes, which has been very quiet for some months. Some fair-sized orders for locomotive tubes were placed lately with local mills. Discounts on iron and steel tubes are given on page 1546.

Coke.—Conditions in the coke trade are slightly better. There was an increase in output last week, and producers report a more active demand for their product. Best grades of 48-hr. blast furnace coke for prompt shipment are now held firm at $4 to $4.25, while on contracts for June up to $4.50, or higher, will likely be paid. Some coke producers are willing to make contracts with furnaces for coke on the basis of six tons of coke for a ton of basic iron, but the furnace interests want six and a quarter tons of coke for a ton of basic iron, which at the present price of basic iron, would figure out about $4.12 for the coke. It is not unlikely some contracts for coke on a sliding scale basis for June and later shipment may be closed this week. We now quote standard grades of 48-hr. blast furnace coke at $4 to $4.25, and best grade of 72-hr. foundry coke at $4.50 to $4.75 for prompt shipment. It is stated several contracts for foundry coke over last half of the year have been made at $5, or better, per net ton at oven. Output of coke in the upper and lower Connellsville regions last week was 108,073 tons, an increase over the previous week of nearly 25,000 tons, the first time an increase has been shown in an output of coke in any week for some months.

Old Material.—The tone of the scrap market is decidedly stronger, and some dealers are not anxious to make sales, believing that prices on nearly all grades of scrap will be from $2 to $3 higher in a short time. The Carnegie Steel Co. is still willing to pay $16 for heavy steel melting scrap, and several other consumers would probably pay the same price. The scrap list of the Pennsylvania Railroad Co., sent out a few days ago, was the heaviest in a long time, it containing nearly 25,000 tons of various grades of scrap. Bids closed on June 3, and awards are to be made June 7. It is said local dealers are bidding more actively on this scrap than on any previous list for a long time. The demand for borings and turnings is light and prices are only fairly strong. Blast furnaces have stopped buying this material, and steel works are not in the market. We advance prices on heavy steel scrap 50c. per ton. Prices on all other grades are firm.

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$16.00 to $16.50
No. 1 cast, for steel plants	17.00 to 17.50
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	16.00 to 16.50
Compressed steel	13.50 to 14.00
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	11.00 to 11.50
Bundled sheet stamping	10.00 to 10.50
No. 1 busheling	13.50 to 14.00
Railroad grate bars	13.00 to 13.50
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	22.00 to 22.50
Iron car axles	28.00 to 29.00
Locomotive axles, steel	28.00 to 29.00
Steel car axles	25.00 to 26.00
Railroad malleable	14.00 to 15.00
Machine shop turnings	10.00 to 10.25
Cast iron wheels	19.00 to 20.00
Rolled steel wheels	17.00 to 18.00
Sheet bar crop ends (at origin)	18.00 to 18.50
Heavy steel axle turnings	12.00 to 13.00
Heavy breakable cast	18.00 to 19.00
Cast iron borings	11.00 to 11.25
No. 1 railroad wrought	19.00

Chicago

CHICAGO, June 3—(*By Wire*).

The feeling in the trade continues to improve. Business is steadily improving, and in general prices remain firm. Structural material continues the most active among finished products, and while fewer fabricating awards were made this week there has been a steady increase in inquiries, the most notable of which is one calling for 12,000 tons for a Detroit structure. The only weakness to be noted is in sheets, which are now generally selling at from 2 to $4 per ton below the prices established in March. This reduction is attributed to the action of certain Ohio mills which desire to dispose of accumulated stocks. While there has been a general increase in orders booked, this added business has not yet had an effect on the mill operations of the leading interest, which is still on a 60 per cent basis. The foremost independent, however, is now operating at about 75 per cent of capacity as against 60 per cent a week ago.

Pig iron has taken a new lease of life. Foundries are placing orders for their second half requirements and many of these are for amounts ranging from 2000 to 3000 tons or more. One order for 12,000 tons of Northern foundry has been received. Activity is confined largely to foundry iron. While malleable is not active, one order for 8000 tons for second half delivery was recently placed. The Southern producer, which has been taking first half business on the Chicago base, is now taking orders for third quarter delivery on that basis. It has discontinued, however, the absorption of freight on iron with a silicon content less than 2.25 per cent. One other Southern furnace has absorbed freight on some orders.

Ferroalloys.—There is little activity in any of the ferroalloys.

We quote 80 per cent ferromanganese, resale, at $110 to $125, delivered; 50 per cent ferrosilicon, resale, at $110, delivered; 16 to 22 per cent spiegeleisen, resale, at $30, delivered; spiegeleisen, 18 to 22 per cent, $35 furnace.

Plates.—Mill operation continues on a healthy basis and bookings in the aggregate are encouraging. The foremost independent has received an order for 1000 tons of plates from Japan to take the place of an old contract for which specifications were never sent forward. The Government has reinstated two vessels in the North Pacific Coast shipbuilding program, which allots 8000 tons of plates, shapes and bars to the leading interest, most of the tonnage being in plates.

The mill quotation is 2.65c. Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Bars.—Bars are less active than some other iron and steel products. Nevertheless there has been somewhat of an improvement in business. Numerous orders for small lots of mild steel and iron bars are coming from manufacturers in various lines and increasing amounts of merchant steel and rail-carbon steel bars are being specified in connection with reinforced concrete projects. Bedstead and fence post manufacturers have been purchasing rail-carbon steel more heavily of late. It cannot be said, however, that mill operation is good. Prices are firm.

Mill prices are: Mild steel bars, 2.35c. Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.50 to 2.60c. Chicago, rail carbon, 2.45c. mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Pig Iron.—The local market is increasing in activity. One seller has experienced the best week in two years and all dealers with the exception of those representing Southern furnaces, which have not yet absorbed the freight to Chicago, are enjoying a good business. Numerous orders for second half delivery ranging from 1000 to 3000 tons, have been booked and one order for 12,000 tons of foundry for last half delivery was received early this week. Interest is confined largely to foundry iron. One order for 8000 tons of malleable for second half delivery has been received, but in general there is little demand for malleable. The Southern producer which recently reduced its quotations to the Chicago base is now taking business at those prices for third quarter as well as first half delivery, but is out of the market on iron running lower than 2.25 per cent silicon. One other Southern furnace is absorbing freight on some business, in one instance having assumed freight to the extent of $3.90. Several lots of charcoal iron in the neighborhood of 1000 tons each have been sold for second half delivery. One Tennessee producer of silvery is now selling on a Birmingham basis.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, average silicon, 1.50, second half delivery, f.o.b. furnace, average freight to Chicago $2.50 (other grades subject to usual differentials)	$29.25
Lake Superior charcoal, first half, nominal	38.85
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	28.50
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	26.75
Northern high-phosphorus foundry	26.75
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	29.75
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	28.00
Southern foundry, silicon, 1.75 to 2.25	26.75
Malleable, not over 2.25 silicon	27.25
Standard Bessemer	27.95
Basic	26.75
Low phosphorus (copper free)	48.25
Silvery, 7 per cent	41.55

Structural Material.—While there has been a falling off in awards for fabrication, business pending and new inquiries for attractive tonnages forecast a continuation, if not an acceleration, of activity in the structural field. The American Bridge Co. will fabricate 540 tons for the Orpheum Theater Building, New Orleans. The Chicago & Northwestern Railway has awarded three plate girder spans amounting to 244 tons to be used in the construction of bridges on the Sioux City and the Iowa and Minnesota divisions. Other awards include 200 tons for the Hamilton Mfg. Co. plant, Two Rivers, Wis., to the Milwaukee Structural Steel Works, Milwaukee, Wis., and 200 tons for the Iron Mountain Co. plant, 833 East Ninety-fifth Street, Chicago, to the Kenwood Bridge Co., Chicago. The largest inquiry which has appeared for several months is one calling for from 10,000 to 12,000 tons to be used in the construction of an office building for the General Motors Corporation at Detroit. The Thompson-Starrett Co. has the general contract for the structure. Fabricators are preparing to bid on from 3000 to 3500 tons for the John Crerie Library, Chicago, the new plans for which were completed to-day. Armour & Co. is inquiring for 1250 tons for a power house at Kansas City, Kan. Other inquiries include:

Times-Picayune building, New Orleans, 800 tons.

Superstructure for foot subway in Canal Street, Chicago Union Station, 625 tons, bids due June 6.

Foundry for Moline Plow Co., Moline, Ill., 150 tons.

Candy factory, Robert J. Johnston, Milwaukee, 100 tons largely of reinforced concrete; George A. Fuller Co., Chicago, general contractor.

Two 170-ft. spans and one 100-ft. span, Mackinaw River Bridge, Tazewell County, Ill., tonnage not given; G. F. Burch, assistant State engineer, Springfield, in charge.

The general contract for the Wells Street Bridge, Chicago, is practically closed, and it is expected that the fabrication will be awarded soon. Financial difficulties are delaying the award of 4500 tons for the approaches to the Michigan Boulevard Link, Chicago. The Edison Electric Appliance Co., Chicago, which recently considered bids on 500 tons for a plant addition, is revising its plans of the structure. The taking of bids on 700 tons for the Federal Reserve Bank, Dallas, Tex., has been postponed until the end of next week. There are a number of projects still in the hands of the architects which promise to call for round tonnages of shapes. The Grand Pacific Hotel, Chicago, was closed to-day and will be wrecked to provide room for the bank to be erected by the Merchants Loan & Trust Co. and the Illinois Trust & Savings Bank, which recently merged. It has not yet been definitely decided what type of building will be constructed. The Fort Dearborn National Bank, Chicago, plans to erect an 18-story addition and the Old Colony Life Insurance Co. has pre-

pared drawings for an 18-story structure in Quincy Street, between Wells and La Salle streets. The Boyce Building, Chicago, is to be remodeled and will call for 600 or 700 tons of structural shapes. Other improvements proposed are a million-dollar stadium for Grant Park, Chicago, and a half-million dollar bridge at North Avenue, Milwaukee.

The mill quotation is 2.45c. Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. for material out of warehouse.

Sheets.—Shading has become so general that it is doubtful whether any business of consequence is being taken at the prices which obtained following the meeting of the Industrial Board and the steel interests in March. The concessions offered range from $2 to $4 per ton. The depression in prices is attributed to certain Ohio mills which wish to dispose of accumulated stocks. The volume of business, however, is increasing, and while no large tonnages have been placed numerous orders for lots ranging from 200 to 300 tons each have been received. It is felt that when the demand gets into full swing prices will stiffen.

Mill quotations are 4.25c. for No. 28 black; 3.45c. for No. 10 blue annealed, and 5.60c. for No. 28 galvanized.

Jobbers quote Chicago delivery out of stock: No. 10 blue annealed, 4.57c.; No. 28 black, 5.37c., and No. 28 galvanized, 6.72c.

Wire Products.—Business is steadily improving. In fact, it is better than generally obtains at this season of the year, because many purchases which were deferred this spring because of uncertain price situation are now being made. Not only are orders numerous, but they are for more generous amounts, this fact being attributed to the decreasing timidity on the part of buyers. Fencing and barbed wire are particularly active and there is a growing demand for nails.

Rails and Track Supplies.—The leading interest's share of the rail order recently placed by the Railroad Administration is 33 000 tons, the rolling of which will add to the already noticeable improvement in general steel mill operations. As yet the placing of the rails has not been followed by increased activity in track fastenings. Over 1000 tons of rails were recently booked for shipment to Japan and considerable business in light rails for road construction work is developing. Among recent bookings were individual orders for 700 tons and 200 tons, which are considered fair sized contracts for light rails.

Standard railroad spikes, 3.35c. Pittsburgh. Track bolts with square nuts, 4.35c. Pittsburgh. Steel tie plates and iron angle bars, 2.75c. Pittsburgh and Chicago; tie plates, iron, 2.75c. f.o.b. makers' mills. Light rails, 2.45c. f.o.b. makers' mills, with usual extras.

Bolts and Nuts.—Mills are now operating at about 75 per cent of capacity, as against less than 50 per cent during the slack period just closed, and business is steadily improving. The automobile industry is buying heavily and whereas previously this year it placed orders for 60 or 90 days' requirements at the most, it is now buying for longer periods, thereby demonstrating that further price reductions are not looked for. There is a general demand from a variety of sources and purchasers no longer show a disposition to balk on account of price considerations. The railroads and the agricultural implement manufacturers are commencing to buy moderately after being practically out of the market for several months.

Structural rivets, 4.72c.; boiler rivets, 4.82c.; machine bolts up to ¾ x 4 in., 50 and 10 per cent off; larger sizes, 40 and 10 off; carriage bolts up to ¾ x 6 in., 50 and 5 off; larger sizes, 40 off; hot pressed nuts, square tapped and hexagon tapped, $2 off; coach or lag screw, gimlet points, square heads, 50 and 10 per cent off. Quantity extras for nuts are canceled.

Cast Iron Pipe.—Chicago has awarded 985 tons to the United States Cast Iron Pipe & Foundry Co., and Springfield, Ohio, has let 125 tons to the Massillon Iron & Steel Co., Massillon, Ohio. Cleveland received bids on 900 tons May 29, and Rochester, Minn., will take bids on 53 tons on June 5.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $54.80; 6-in. and larger, $51.80; class A and gas pipe, $1 extra.

Old Material.—Consumers are beginning to show interest in scrap, but are very cautious about entering the market for fear of causing an upward trend in prices. Nevertheless, a few inquiries for round tonnages have been made by them, one of which calls for 2000 tons of cast scrap. In the meantime, actual buying is confined to dealers who, having regained their confidence, continue to bid up prices in connection with purchases of railroad scrap. In fact, some brokers have paid more for this material than the prices quoted below. As there is still a divergence between what dealers are willing to sell for and what consumers are willing to pay, it is difficult to determine the exact status of the market. Railroad offerings include 3500 tons advertised by the Chicago & Northwestern and a large Pennsylvania Railroad list.

Per Gross Ton

We quote delivery in buyers' yards, Chicago and vicinity all freight and transfer charges paid, as follows:

Iron rails	$21.00 to $22.00
Relaying rails	35.00 to 45.00
Carwheels	20.50 to 21.50
Steel rails, rerolling	17.50 to 18.00
Steel rails, less than 3 ft.	17.50 to 18.00
Heavy melting steel	15.50 to 16.00
Frogs, switches and guards cut apart	15.50 to 16.00
Shoveling steel	15.25 to 15.75

Per Net Ton

Iron angles and splice bars	$17.25 to $18.25
Steel angle bars	14.75 to 15.25
Iron arch bars and transoms	22.00 to 23.00
Iron car axles	26.50 to 27.50
Steel car axles	22.50 to 23.50
No. 1 busheling	13.50 to 14.00
No. 2 busheling	9.50 to 10.00
Cut forge	14.25 to 14.75
Pipes and flues	12.00 to 12.50
No. 1 railroad wrought	15.75 to 16.25
No. 2 railroad wrought	14.25 to 14.75
Steel knuckles and couplers	15.75 to 16.25
Coil springs	16.75 to 17.25
No. 1 cast	19.50 to 20.50
Boiler punchings	18.00 to 19.00
Locomotive tires, smooth	16.50 to 17.00
Machine shop turnings	5.00 to 5.50
Cast borings	8.00 to 8.50
Stove plate and light cast	15.50 to 16.00
Grate bars	15.00 to 15.50
Brake shoes	13.75 to 14.25
Railroad malleable	15.00 to 16.00
Agricultural malleable	14.50 to 15.00
Country mixed	11.00 to 12.00

Philadelphia

PHILADELPHIA, June 3.

The rate of progress toward larger bookings of steel orders in this market has not been all that it was expected it might be, but there is unquestionably an improvement, slight though it is. Among sellers there is optimism that business will continue to expand gradually despite the approach of the heated months, which usually signalize a falling off in demand. A frequent prediction is that by August or September a large buying movement in steel products will be in full swing.

Pig iron business also shows a light improvement, but orders are being taken at the expense of prices. A Virginia maker of foundry iron has formally reduced his quotations $1 a ton, while eastern Pennsylvania No. 2X iron is available at about $28, furnace. Basic and low phosphorus iron will drop to new levels when there is business to be done. Standard low phosphorus is obtainable at about $40, furnace, and copper bearing at $35, furnace, while basic could undoubtedly be bought at about $26, furnace.

The scrap market shows strength, based largely on sentiment among dealers, as Eastern mills are staying out of the market.

Pig Iron.—Though some sellers of pig iron are predicting higher prices within the near future, the present tendency in this market is downward. A Virginia maker of foundry iron has reduced prices $1 a ton, and at this lower quotation has taken orders for about 12,000 tons, mostly in New England. The new quotations for Virginia iron are $29.60 for No. 2 plain and $30.60 for No. 2X, delivered Philadelphia district.

Eastern Pennsylvania iron also shows a downward tendency, No. 2X being available from some furnaces at $28, furnace, while a resale lot of 200 tons of iron analyzing 2.25 to 3.25 silicon, has been offered to consumers in this district at $27, furnace. We note a sale of 1000 tons of high manganese malleable iron at $28.25 per ton, delivered to a New York State consumer. A central Pennsylvania consumer bought 500 tons of No. 2X iron at $28.30, delivered. A part of this is said to have been Virginia iron, the freight rates from Virginia furnaces to the consumer's plant being $3.30. A sale of 100 tons of No. 2X iron at $29.50, delivered, was made by a local merchant, and this price has been shaded on one or two small transactions. Though there has been no inquiry and no sales of basic iron, there seems to be no doubt that it could be had at about $26, furnace. Low phosphorus grades are weakening, copper free being available at about $40, furnace, and copper bearing at $35, furnace. The local ordnance office took bids last week on about 3000 tons of standard low phosphorus. The bids ranged from $20 to $36 a ton and were all rejected as being unsatisfactory. Business in pig iron is showing a slight improvement, but companies which have offices in other cities say that the volume of orders in this market is much below that reported from their other offices. Some contracts are being made for third quarter and a few running into fourth quarter. Furnace companies are getting requests from consumers to protect them against price declines, but this sellers so far have refused to do. We note a sale of 1000 tons of foundry iron for June-July delivery. We quote standard grades of iron for delivery in the Philadelphia district as follows, except that the quotations for low phosphorus iron, which are nominal, are f.o.b. furnace:

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	$29.50
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	28.50
Virginia No. 2 X (2.25 to 2.75 sil.)	30.60
Virginia No. 2 plain (1.75 to 2.25 sil.)	29.60
Basic	29.65
Gray forge	28.50
Standard low phosphorus (f.o.b. furnace)	46.75
Copper-bearing low phosphorus (f.o.b. furnace)	43.75

Semi-Finished Steel.—The demand for billets and slabs is very light, sales being mostly in lots of 50 to 100 tons. Some sellers report that the market has been upset by sales of forging quality billets at the price for rerolling billets, $38.50, Pittsburgh. This price, or $42.50, delivered Philadelphia district, is being asked by companies represented in this market for open-hearth rerolling billets.

Finished Steel.—While there is a perceptible improvement in demand for various steel products, the orders being received by Eastern mills are mostly for small lots and the aggregate tonnage has not yet approached a point requiring increase in the rate of mill operations. There is very little business in plates and several mills in the East which have been operated only intermittently of late are still in the same position as to operating schedules. One Eastern plate mill is shut down because of a strike of men at the gas producers who objected to a return from an 8-hr. to a 10 and 12-hr. day. There is some improvement in the number of orders for structural shapes, but these orders are mainly for small buildings, and several large building projects which were expected to come into the market have not yet materialized. Demand for steel bars is better than for other steel products, one company reporting that its bar business is entirely satisfactory. Despite the confusion caused in the blue annealed sheet market by the selling of Nos. 10, 11 and 12 gage blue annealed sheets on the plate base, making a price for sheets of about 3.18c., Pittsburgh, a local mill has taken several very fair orders for blue annealed at 3.55c., Pittsburgh. Street railroads and industrial plants are inquiring for small tonnages of rails. One company is still quoting $55 and $57 for heavy rails, which it quoted on the 200,000 tons bought by the Railroad Administration. Other companies are quoting $45 and $47. Prices on steel products are being held firmly by many of the steel companies, but here and there shading is being done in devious ways, generaly by concessions on extras. The most pronounced weakness seems to be in plates, and quotations ranging from 2.50c. to 2.75c. have been made on recent inquiries. It is reported here that 2000 tons of plates were bought by a mid-West oil company in the Pittsburgh or Youngstown district.

We quote prices for delivery in Philadelphia or vicinity as follows: Plates, 2.895c.; structural shapes, 2.695c.; steel bars, 2.595c.; No. 10 blue annealed sheets, 3.795c.; No. 28 black, 4.595c.; No. 28 galvanized, 5.945c.

Bar Iron.—Domestic demand for bar iron is light, though some of the mills are booking a fair amount of export business. The two Eastern bar iron mills which were shut down several weeks ago because of a strike will remain closed indefinitely. We quote common bar iron at 2.595c. and double refined bar iron at 1c. a lb. higher.

Bolts—A Philadelphia shipyard is in the market for 1,200,000 fitting-up bolts.

Ferroalloys.—Producers of ferromanganese, who recently reduced their asking price to $125, delivered, assert that this is the bottom, high costs of production making any further decline out of the question. Resale lots of ferromanganese are occasionally being offered, however, at around $100. The producers are asking $35 for spiegeleisen, 18 to 22 per cent, but resale lots have recently been obtainable at $2 or $3 under this price. A ship arriving at this port last week brought 500 tons of British ferromanganese valued at $20,439.

Coke.—The Rainey-Wood Coke Co., Philadelphia, whose by-product coke plant will be completed and ready for operation about July 1, is offering coke for last half shipment. A price of $5.25 is being asked for foundry coke, to which the Connellsville freight will be added, while furnace coke will be sold on the same basis as Connellsville bee-hive coke is sold. The new coke plant will be operated in conjunction with the plant of the Alan Wood Iron & Steel Co.

Old Material.—The scrap market shows increasing strength, but this is based very largely on sentiment, as Eastern mills are not buying. Ideas of dealers as to the prices they will accept for their material show considerable optimism as to the course of prices within the near future. For No. 1 heavy melting steel, a number of yard dealers have refused $15.50, delivered, and declare they are holding for $18 to $20 a ton. One Eastern plant was offered a small tonnage of No. 1 melting steel at $16, delivered, but refused to buy at this price. However, $15.50 would be easily obtainable and $15.75 has been paid in one instance. The Pennsylvania Railroad has issued its June list, which offers about 20,000 tons. Government scrap is also being offered in large tonnages. The Chicago district ordnance office has asked for bids on 42,000 tons. About 33,000 tons of shell ingots and forgings at two Michigan plants was sold to a dealer at a price slightly above $16. It is reported here that the scrap will be stored for higher prices. We quote for delivery at consumers' works in eastern Pennsylvania as follows:

No. 1 heavy melting steel	$15.50 to $16.00
Steel rails, rerolling	18.00 to 18.50
No. 1 low phosphorus, heavy, 0.04 and under	22.00 to 23.00
Iron rails	20.00 to 22.00
Carwheels	20.00 to 21.00
No. 1 railroad wrought	21.00 to 22.00
No. 1 yard wrought	19.00 to 20.00
Country yard wrought	12.00 to 15.00
No. 1 forge fire	12.00 to 13.00
Bundled skeleton	12.00 to 13.00
No. 1 busheling	15.00 to 16.00
No. 2 busheling	13.00 to 14.00
Turnings (short shoveling grade for blast furnace use)	11.00 to 11.50
Mixed borings and turnings (for blast furnace use)	9.50 to 10.00
Machine-shop turnings (for rolling mill use)	11.00 to 11.50
Cast borings (clean)	12.50 to 13.50
No. 1 cast	22.00 to 23.00
Grate bars	17.00 to 18.00
Stove plate	17.00 to 18.00
Railroad malleable	18.00 to 19.00
Wrought iron and soft steel pipes and tubes (new specifications)	17.50 to 18.00
Ungraded pipe	13.00 to 14.00

Birmingham

BIRMINGHAM, ALA., June 3.

Southern pig iron producers are meeting competition in the Middle West, but there is no absolute admission that the entire freight is being absorbed. There is evidence that iron is selling in this district at $25.75 per ton, No. 2 foundry, 1.75 to 2.25 per cent silicon, which is $1 per ton less than the recently fixed price for the product, f.o.b. furnaces. It is understood that but little business is being accepted for fourth quarter though there are inquiries in hand. Another interest admitted selling at the $1 per ton reduction and said that competition was so keen that consumers were watching every opportunity. The fact that there has been some buying and some tonnage has been disposed of is looked to to have a strengthening effect on the market and not only a better demand is probable this month but an advancing price. Inquiries being received in this territory are for better tonnages than heretofore, mention being made of several orders ranging from 1000 to 1500 tons each, last half of year delivery being stipulated. The Woodward Iron Co. now has two furnaces in blast and the Sloss-Sheffield Steel & Iron Co. is preparing to blow out the Sheffield furnace and will blow in a North Birmingham furnace. Representatives of Southern furnace companies have been in the Middle West territory and have made calls on the trade and looked the situation over with a scrutiny that bespeaks future business. There is a more optimistic feeling. We quote per gross ton f.o.b. Birmingham district as follows:

Foundry, 1.75 to 2.25 silicon	$25.75 to $26.75
Basic	25.75

Cast-Iron Pipe.—Several specifications for cast-iron pipe were received by the producers of the product in this district the past week and the business is much improved. The recent reduction in prices appears to have induced buying and considerable iron will be melted on contracts in hand at the pipe plant. All pipe plants are preparing for a steady operation.

Old Material.—Dealers have been laying in stock and preparing for a better demand, which some believe will start in this month while others are not so hopeful and do not expect a change for the better until September or October. But little change in quotations is noted. Consumers of heavy melting steel are still active for stock for future use. Following quotations obtain:

Steel rails	$12.00 to $14.00
No. 1 heavy steel	13.00 to 14.00
Cast iron borings	6.50 to 7.50
Machine shop turnings	6.50 to 7.50
Stove plate	15.00 to 16.00
No. 1 cast	20.00 to 22.00
Carwheels	20.00 to 22.00
Tramcar wheels	20.50 to 22.00
Steel axles	18.00 to 20.00
No. 1 wrought	12.50 to 14.00

St. Louis

ST. LOUIS, June 2, 1919.

Pig Iron.—The market on pig iron has shown no marked change during the week and about the only purchases recorded were of small lots for immediate or nearby delivery to meet actual requirements on contracts. The impression is growing that there will be little or no activity until after the opening of the last half. About all of the big steel plants are shut down or so nearly so that their consumption of pig iron is negligible, and this statement applies to both sides of the river. No further adjustment of prices has been reported and both sides seem to be awaiting developments.

Coke.—No business in coke has appeared, naturally, since the melters are not in the market for pig iron, and in consequence no buying of metallurgical coke is expected until it becomes time to act on contracts expiring with the end of June.

Finished Iron and Steel.—In finished products there seems to be a slowly increasing interest, as more and more building is reported, but as yet the demand is not at all heavy and therefore there is no feature to the market. For stock out of warehouse we quote as follows:

Soft steel bars, 3.44c.; iron bars, 3.44c; structural material, 3.54c.; tank plates, 3.74c.; No. 8 blue annealed sheets, 4.59c.; No. 10 blue annealed sheets, 4.64c.; No. 28 black sheets, cold rolled, one pass, 5.44c.; No. 28 galvanized sheets, black sheet gage, 6.79c.

Old Material.—The scrap market continues to have a fairly strong atmosphere, but the buying actually effected is so limited as to be negligible. Dealers having stock are disposed to hold it firmly and there is no tendency to trade among dealers to any extent. The consuming interests continue to buy nothing except manifest bargains and altogether, although the tone is better there is nothing actually being done to support the attitude of the dealers. We quote dealers' prices, f.o.b. customers' works St. Louis industrial district, as follows:

	Per Gross Ton	
Old iron rails	$21.50 to	$22.00
Old steel rails, rerolling	17.00 to	17.50
Old steel rails, less than 3 ft.	16.00 to	16.50
Relaying rails, standard sections, subject to inspection	34.00 to	37.00
Old carwheels	19.50 to	20.00
No. 1 railroad heavy melting steel	15.00 to	15.50
Heavy shoveling steel	13.00 to	13.50
Ordinary shoveling steel	12.50 to	13.00
Frogs, switches and guards, cut apart	15.00 to	15.50
Ordinary bundled sheets	8.50 to	9.00
Heavy axle and tire turnings	9.50 to	10.00
	Per Net Ton	
Iron angle bars	$15.50 to	$16.00
Steel angle bars	13.00 to	13.50
Iron car axles	26.50 to	27.00
Steel car axles	21.50 to	22.00
Wrought arch bars and transoms	19.50 to	20.00
No. 1 railroad wrought	15.00 to	15.50
No. 2 railroad wrought	13.50 to	14.00
Railroad springs	13.00 to	13.50
Steel couplers and knuckles	14.00 to	14.50
Locomotive tires, 42 in. and over, smooth inside	15.00 to	15.50
No. 1 dealers' forge	10.50 to	11.00
Cast iron borings	8.00 to	8.50
No. 1 busheling	13.00 to	13.50
No. 1 boiler cut to sheets and rings	10.50 to	11.00
No. 1 railroad cast	19.50 to	20.00
Stove plate and light cast	14.50 to	15.00
Railroad malleable	13.00 to	13.50
Pipes and flues	12.00 to	12.50
Heavy railroad sheet and tank	10.50 to	11.00
Railroad grate bars	12.00 to	12.50
Machine shop turnings	7.00 to	7.50
Country mixed	11.50 to	12.00
Uncut railroad mixed	12.50 to	13.00
Horseshoes	16.00 to	16.50

Buffalo

BUFFALO, June 3.

Finished Iron and Steel.—The outstanding development of the week is the contracting for hot-rolled products: bars, plates and shapes, users showing quite an active disposition towards making placement. It is understood a number of third quarter contracts have been closed, and definite orders are also more freely placed. This applies to domestic business entirely, as there has been an almost complete tie-up of business on the Canadian side of the line due to the labor troubles in Toronto and threatened labor troubles in other large Canadian manufacturing centers. Compared with recent weeks there has been noticeable increase in inquiry for fabricated steel for building projects, some of it involving considerable tonnages. A new 10-in. bar mill has recently been put into commission by the Donner Steel Co. at its Buffalo plant.

Prices f.o.b. Buffalo are as follows: Steel bars, 3.40½c.; iron bars, 4.10½c.; shapes, 3.50½c.; plates, 3.70½c.; No. 10 blue annealed sheets, 4.60½c.; No. 28 black, 5.65½c.; No. 28 galvanized sheets, 7.00½c. For "store door delivery" add 0.04½c. to each commodity.

Pig Iron.—The pig iron market continues to show unmistakable signs of improvement and greater confidence is manifest in the view that business will continue to grow and gradually assume normal proportions. A total of nearly 25,000 tons of foundry grades and approximately 10,000 tons each of basic and of

malleable iron have been sold from this district during the week, reaching an aggregate of almost 50,000 tons; 1000 tons of this amount was for export. About 12,000 tons of the foundry grades sold was for delivery over a period of 60 days and 15,000 to 20,000 tons of the sales were for delivery over third quarter and last half. Additional inquiry is before the market. One producing interest reports inquiries for 10,000 to 20,000 tons of foundry and malleable and another interest 2000 tons of foundry and 1000 tons of malleable. Prices, in the main, show little, if any, recession, and reports received seem to indicate that the slight concessions made in some instances week before last have been eliminated from current quotations. In fact, in some quarters talk continues to crop out of the possibility of a higher price level later on. We quote the schedule as follows, f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	$29.75
No. 2 X, 2.25 to 2.75 silicon	28.00
No. 2 plain foundry, 1.75 to 2.25 silicon	26.75
Gray forge	25.75
Malleable, silicon not over 2.25	27.25
Basic	25.75
Basic, 1 to 1½ per cent manganese	26.25
Basic, 1½ to 2½ per cent manganese	26.75
Bessemer	27.95
Lake Superior charcoal, regular grades, f.o.b. Buffalo	32.35

Old Material.—The market is showing marked increase in demand, particularly from points outside the local district, and inquiry includes several large lots. Local inquiry and buying is not a negligible quantity, either, as one sale of 10,000 tons of heavy melting steel to a Buffalo consumer was recently completed. Inquiry before the market covers low phosphorus, No. 1 machinery cast, scrap and wrought pipe. The price for heavy melting steel has advanced to $16.50 and $17.00; No. 1 machinery cast to $22.50 and $23.00 per ton; malleable scrap and locomotive grate bars to $18.00 and $19.00 per ton, and wrought pipe to $15.00 and $16.00 per ton. We quote dealers' asking prices, per gross ton, f.o.b. Buffalo, as follows:

Heavy melting steel, regular grades	$16.50 to $17.00
Low phosphorus, 0.04 and under	21.00 to 22.00
No. 1 railroad wrought	19.00 to 19.50
No. 1 machinery cast	22.50 to 23.00
Iron axles	23.00 to 24.00
Steel axles	23.00 to 24.00
Carwheels	21.00 to 22.00
Railroad malleable	18.00 to 19.00
Machine shop turnings	7.00 to 7.50
Heavy axle turnings	13.00 to 14.00
Clean cast borings	11.00 to 12.00
Iron rails	21.00 to 22.00
Locomotive grate bars	18.00 to 19.00
Stove plate	18.50 to 19.00
Wrought pipe	15.00 to 16.00
No. 1 busheling	13.00 to 14.00
Bundled sheet stamping	11.00 to 12.00

Cleveland

CLEVELAND, June 3.

Iron Ore.—Iron ore shipments during the season to June 1 fell off 700,000 tons, as compared with the same period a year ago. The movement by water during May was about 6,500,000 gross tons, as compared with 8,792,231 tons during the corresponding month a year ago. Shipments for the season to June 1 were 8,300,000 tons as compared with 9,028,101 tons during the same period a year ago. Shipments of ore by merchant ore firms improved very little in May, and with nearly two months of the season gone, the movement to independent consumers has not yet gotten well under way, the good volume of shipments so far this season being due to the heavy movement by the Steel Corporation. Ore firms feel that the situation is serious enough to urge consumers to buy ore without further delay. They point to the fact that unless buyers come into the market soon, there will be a rush in the ore movement late in the season when the grain movement will be heavy, and there will be danger of an advance in vessel rates, which the consumer must bear. Another factor that enters into the situation is the danger of a labor shortage late in the season that will interfere with unloading ore at furnaces. One of the ore firms is sending a letter to its trade advising them of the situation, and urging them to cover for their ore requirements promptly. The market is showing a little more life, but is not yet active. One new inquiry has come out involving about 150,000 tons. Ore prices delivered f.o.b. lower lake ports, are as follows:

Old range Bessemer, $6.45; old range non-Bessemer, $5.70; Mesaba Bessemer, $6.20; Mesaba non-Bessemer, $5.55.

Pig Iron.—Demand for foundry iron continues fairly active. Many small consumers came in the market during the week for their requirements for either the third quarter or last half, and sales in lots of 500 tons and under were fairly numerous. Some malleable iron is also being booked, but there is no activity in steel-making grades. One Cleveland interest reports 5000 tons in sales and 27 inquiries during the week, aggregating 19,000 tons, these being well scattered through the Central West and East. One Indiana melter wants 2500 tons of foundry iron. Two other inquiries are for 2000 tons each, and there are two 1000-ton lot inquiries for malleable iron. Sales during the week include 2400 tons of malleable iron placed by two Cleveland consumers with outside furnaces at the regular Valley price of $27.25, the consumers being willing to pay the additional freight rate to secure outside iron for their mixtures. Generally the market is very firm, although some very slight price shading is reported by Southern Ohio furnaces on iron for shipment to Central Ohio points where the freight rate is practically the same from both Southern and Northern Ohio. One or more Alabama furnaces are now meeting the delivered prices of local furnaces on high silicon foundry iron for June and possibly July shipment for Cleveland delivery, quoting iron running 2.25 to 2.75 silicon, at $28.40 delivered. This means the absorbtion of the entire freight rate except 40c., the amount of the switching charge for local iron. It is claimed that a similar reduction in the price of Southern foundry iron, 1.75 to 2.25 in silicon, has not been made, but there is practically no demand for low silicon iron in this territory. The price concession is shutting out Tennessee iron on which a price reduction of $1 a ton was made recently. We quote delivered Cleveland, as follows:

Bessemer	$29.35
Basic	27.15
Northern No. 2 foundry, silicon, 1.75 to 2.25	27.15
Southern foundry, silicon, 2.25 to 2.75	28.40
Gray forge	26.15
Ohio silvery, silicon, 8 per cent	42.65
Standard low phos., Valley furnace	45.75

Finished Iron and Steel.—The demand for finished steel shows a good increase in volume. Many consumers, including makers of automobile parts, implement manufacturers and bolt and nut makers, are placing contracts for the third quarter at regular prices. Some of the implement manufacturers have insisted on contracts for the last half, but mills are refusing to go beyond the third quarter. Building projects requiring structural material are coming more rapidly to a head and some contractors feel that they can obtain better prices from fabricators now than a little later when their shops may be filled up with work. The Fort Pitt Bridge Co. has taken 800 tons for the Cowell & Hubbard Co. Building, Cleveland, and it is also reported to have taken 2000 tons for the Wells Street Bridge, Chicago. The Russell Wheel & Foundry Co., Detroit, has taken the Earnest Kern Stores, Detroit, requiring 100 tons. Inquiry includes 1000 tons for an office extension for the Parish & Bingham Co., Cleveland.

Old Material.—The stronger tone in the scrap market noted last week is still in evidence, although the volume of business is light. Local mills are not actively in the market, but some would buy heavy melting steel at $15 to $15.50, or at lower prices than dealers are willing to make sales. Some dealers are uncertain about the future tendency of the market. A Canton mill which recently offered $16 for a round lot of heavy melting steel is reported to have purchased 1000 tons at that price. Turnings are dull, one local consumer having shut off shipments for three weeks. Dealers are paying $9 for this grade for shipment to a Valley consumer. The Cleveland District Salvage Board of the Ordnance Department, will receive bids June 10

for about 5000 tons of material located at plants in Northern Ohio. About 1500 tons of this is in forgings and shell steel and most of the remainder is in sheets. It is expected, however, that the latter will not be sold for scrap. Prices are unchanged. We quote delivered consumers' yards in Cleveland and vicinity, as follows:

Heavy melting steel	$15.50 to $16.00
Steel rails, under 3 ft	15.75 to 16.00
Steel rails, rerolling	16.00 to 17.00
Iron rails	23.00 to 24.00
Iron car axles	29.50 to 30.00
Steel car axles	27.50 to 28.50
Low phosphorus melting scrap	16.25 to 17.00
Cast borings	9.75 to 10.25
Iron and steel turnings and drillings	8.50 to 9.00
Compressed steel	13.00 to 13.50
No. 1 railroad wrought	17.00 to 17.50
Cast iron carwheels	22.00 to 22.50
Agricultural malleable	14.00 to 15.00
Railroad malleable	17.00 to 18.00
Steel axle turnings	13.50 to 14.00
Light bundled sheet scrap	11.00 to 11.50
No. 1 cast	22.00 to 22.50
No. 1 busheling	13.75 to 14.25
Drop forge flashings, 10 in. and under	13.00 to 13.50
Drop forge flashings, over 10 in.	9.50 to 10.00
Railroad grate bars	16.50 to 17.00
Stove plate	17.00 to 18.00

New York

NEW YORK, June 3.

Pig Iron.—The principal development of the week has been the withdrawal of a number of furnaces from the market, including those of the Virginia Iron, Coal & Coke Co., the Adrian Furnace Co., Dubois, Pa., and the Punxsutawney Furnace Co., Punxsutawney, Pa. No definite statement is made as to the time the furnaces expect to stay out of the market except in the case of the Pennsylvania stacks which will probably be out for the remainder of the year, owing to the fact that they expect to blow out for repairs later and have as much iron booked as they can make until the stacks are blown out. The policy of the Virginia company has not been definitely announced, but the tendency on the part of most Virginia furnaces is conservative. In fact, it may be said that owing to the increase in sales and improvement in sentiment, furnaces in general are not anxious to sell large tonnages for delivery after July 1 at present prices. While for the most part prices are fairly well maintained, there are some irregularities. One Virginia furnace is selling on a basis of $25.50, furnace, or $29.90, New York, for No. 2 plain. Some Buffalo iron, amounting to about 200 tons, has been offered for sale at $27, furnace, for No. 2, or $1 below the usual quotation, but has not been disposed of. A very fair volume of inquiry is pending and on the whole the outlook is encouraging. We quote as follows, delivered New York, for Northern and Southern grades, quotations of the latter being nominal:

No. 1 foundry, silicon, 2.75 to 3.25	$31.55 to $31.80
No. 2 X, silicon, 2.25 to 2.75	29.80 to 30.80
No. 2 plain, silicon, 1.75 to 2.25	28.55 to 29.80
No. 2 X, Virginia, silicon, 2.25 to 2.75	31.40 to 31.90
No. 1 Southern, silicon, 2.75 to 3.25	37.45
No. 2 Southern, soft (all rail), sil., 2.25 to 2.75	35.70
No. 2 Southern (all rail), sil., 1.75 to 2.25	34.45

Ferroalloys.—Some British producers have reduced their quotations so that it is practically on a parity with that of American producers. The British alloy can be purchased at $121, seaboard, as compared with the asking price of American producers of $125, delivered. It is understood that the American quotation can be slightly shaded. Demand continues extremely light with sales limited to carload lots. Nothing is heard of any resale material disposed of in the past week. The output in May was about 11,000 tons. The spiegeleisen market is dull with demand limited to small quantities for prompt delivery, the quotation ranging from $30 to $35, depending upon the quantity involved and the delivery desired. The May production was about 3,400 tons. Imports of manganese ore were surprisingly large in April, having been over 59,000 tons, bringing the monthly average for the first four months above that of the monthly imports in 1918. Demand for 50 per cent ferrosilicon is limited to carload lots for early delivery with quotations as low as $75 per ton, delivered. Quotations for ferrotungsten are difficult to obtain in the absence of any real test of the market. Ferrochrome, 60 to 70 per cent, carload lots, is nominal at 32c. to 34c. per lb. of contained chromium, depending on carbon content. In small lots 2c. per lb. more is added. Ferrochrome, carbon free, 60 per cent chromium, is obtainable at 70c. per lb. of alloy. Ferrovanadium is quoted at $6 per lb. of contained vanadium in wholesale lots for early delivery. Ferrocarbon-titanium, 15 to 18 per cent, is selling at $200 per net ton in carload lots, at $220 per ton in lots between one ton and a carload, and at $250 per ton in lots less than a ton, f.o.b. Suspension Bridge, N. Y.

Finished Iron and Steel.—Fewer buyers seem to be looking for lower prices. Buyers for export are inclining to this view. It remains that many believe a large and attractive order will bring out a concession. The fact is that there are few notable transactions sufficing as a test and practically all of the going business is being written at the prevailing price levels. The activity manifested two weeks ago has tapered off, and in some lines, such as bolts and nuts and bar iron, the market is dull. The growing belief in the present price stability is indicated in a number of instances of manufacturing consumers asking for last half contracts. Mills are accepting the contracts but only for the third quarter. Another instance of a $3 cut in plate prices and chargeable also to export business is covered in about 350 to 400 tons of plates for 12 locomotives for Corea and 10 for South Africa. These are to be built by the American Locomotive Co., which is buying at the basis of 2.50c., Pittsburgh. There are other irregularities like the sale of a small tonnage of plates at $1 below the general level with the base price applying even to plates of 3/16 in. thickness. A proposal has been made to sell a round tonnage of plates for export under an arrangement for a rebate of $2 to the intermediary, the plates being billed at the 2.65c. rate. Japan is about to buy 10,000 tons of rails, seemingly entering the market in 10,000 ton lots and having apparently purchased recently a total of 50,000 tons. On the last installment it appears that $47 was paid, an indication that the export spread of $10 above the domestic price was not long held. Among the encouraging features are large demands likely to come from new shipbuilding operations and further structural steel work. Shipyards are now taking contracts for private owners. The building operation has entered a new phase in that quite a number of inquiries for large size apartments are now under consideration. These are ventures of well known apartment house builders. One fabricator who in late weeks has closed on about 10,000 tons of work is figuring on 50,000 tons in addition. Two large industrial projects are among those promising early settlement, one of 2,500 tons and the other of 3,500 tons. Other structural work before the market includes 800 tons for the Haywood Bros. & Wakefield Co., Gardner, Mass.; 1800 tons for a bridge for the Boston & Maine; 250 tons for a T. N. T. factory at Fort Mifflin; 500 tons for the General Coffee & Tea Co., Baltimore, and a theater taking 350 tons in Newark. It is thought likely that a 2,000-ton crane runway for the Brooklyn Navy Yard will soon be favorably considered. The contract awards include 400 tons for a machine shop extension for the Lehigh Valley to the Levering & Garrigues Co., and 200 tons for a storage building for the Stanley Works, New Britain, Conn., to the Berlin Construction Co. We quote mill shipments as follows: Bar iron, refined grade, 2.62.; double refined bar iron, 3.62c.; soft steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c.; all New York.

Warehouse Business.—Buying is characterized by one or two so-called good days frequently followed by a similar stretch of dull business. While tonnage of warehousing averaged 20 per cent greater in May than April, nearly all orders, as for some time, are confined to immediate manufacturing needs. There is casual talk of increasing tendency on the part of manufac-

turers to come forward for future requirements as in normal times; but practically nothing tangible can be placed against this. While it is difficult after the protracted war stress to re-establish a common idea of what is normal business, a survey shows some of the larger jobbers handling about half the full capacity of their warehouse, while specialty houses are more nearly at a two-thirds level. While the leading interest has as yet made no announcement affecting discounts on bolts and nuts, rivets, spikes, etc., a revision will take place on all these lines not later than the first of next month, so as to give a somewhat larger margin for jobbing. We quote out-of-store as follows: No. 10 blue annealed sheets, 4.57c.; No. 28 black sheets, 5.37c.; No. 28 galvanized sheets, 6.50c.; steel bars, 3.37c.; structural shapes, 3.47c.; plates, 3.67c.; bands, 3/16 in., Nos. 10 and 12, 4.07c.; shafting, 5 off list.

High-Speed Steel.—Practically no new business is to be had, so far as the large buyers are concerned. A general disinclination on the part of many manufacturers to do any stocking of their regular products is held to be perhaps the heaviest check to the resumption of normal conditions in the market for this material. It is reported that one high-speed steel maker, with a large over-supply of returned Government material, is willing to dispose of some of it at $1.35 per lb. Another element of uncertainty in market developments is an offer of Sheffield steel to ship into this country at the same price. It is reported that the British Government is disposing of large supplies of tungsten concentrates to the mills there at such low prices that Sheffield plants are easily able to quote 4s. at mill, which with their low shipping rates creates a situation that may result under existing tariffs in stiff competition from England for the high-speed steel business in this country. We hold quotations at the average price of $1.60 per lb.

Cast-Iron Pipe.—The reduction of $5 per ton has not yet brought out any business and the outlook for municipalities coming into the market is not encouraging. It is to be noted, however, that on some small orders from private buyers, prompt delivery is being urged. We quote New York prices as follows: 6-in. and heavier, $52.70; 4-in., $55.70; 3-in., $62.70, and $1 additional for class A and gas pipe.

Old Materials.—Prices remain practically where they were last week in spite of a much better feeling, intangible as that may be. Very few sales—and those of low tonnage—have been recorded. Optimism is based upon the reports of more building operations, greater activity in the steel plants, the absence of a lowering of prices of commodities, particularly of steel, and even, perhaps, the bullish tendencies in Wall Street. The chief speculation among brokers and dealers relates to the time when the expected boom in scrap prices will in reality set in. Brokers' and dealers' buying prices, New York, follow:

Heavy melting steel	$11.75 to $12.25
Rerolling rails	16.00 to 16.50
Relaying rails, nominal	39.00 to 41.00
Steel car axles	20.50 to 21.50
Iron car axles	25.00 to 26.00
No. 1 railroad wrought	19.00 to 19.50
Wrought iron track	13.50 to 14.50
Forge fire	7.50 to 8.00
No. 1 yard wrought, long	16.00 to 16.50
Light iron	5.50 to 6.00
Cast borings (clean)	8.50 to 9.00
Machine shop turnings	8.50 to 9.00
Mixed borings and turnings	7.00 to 7.50
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long	13.50 to 14.00
Stove plate	14.50 to 15.00
Locomotive grate bars	14.00 to 14.50
Malleable cast (railroad)	13.00 to 13.50
Old carwheels	20.00 to 20.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast	$21.00 to $21.50
No. 1 heavy cast (columns, building materials, etc.), cupola size	20.00 to 20.50
No. 1 heavy cast, not cupola size	14.00 to 15.00
No. 2 cast radiators, cast boilers, etc.)	16.50 to 17.00

Cincinnati

CINCINNATI, June 3—(*By Wire*).

Pig Iron.—The tide seems to have turned and business in foundry iron is very good. A comparatively large number of Southern foundry iron sales was made last week and there was also considerable business done in Northern iron. Numerous inquiries are being figured on, most of which are for third quarter and last half shipment. Among sales of Southern iron for last half in this territory is one for 1500 tons, two for 1000 tons each and several for 500 tons, and other smaller amounts. In fact, the month of May has proved to be a larger one than any two previous months of the year. Southern furnaces are generally willing to equalize freight rates in competition with other producing centers and on more desirable business better than this has been done. To equalize the Birmingham rate as compared with Ironton to points taking the Cincinnati rate means a price of $24.95, Birmingham. As far as the Birmingham district proper is concerned, it is understood that iron there is sold at the previous schedule of $26.75. It was found necessary in some southern Ohio contracts to also absorb adverse freight differentials for shipment to competitive points where rates from other producing centers were lower. However, this has not been necessary except in a comparatively small number of cases. It is reported that the Standard Sanitary Mfg. Co. has bought an additional amount of Southern iron for third quarter shipment to Louisville, 3000 tons being the estimated amount of the contract in question. A leading Virginia producer has withdrawn from the market and this action practically puts that district out of the running. Both Lake Superior charcoal and high silicon irons are in excellent demand and the regular schedule is being adhered to.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, silicon, 1.75 to 2.25 (base price)	$28.55
Southern coke, silicon, 2.25 to 2.75 (No. 2 soft)	29.80
Southern gray forge	28.55
Ohio silvery, 8 per cent silicon	42.05
Southern Ohio coke, silicon, 1.75 to 2.25 (No. 2)	23.55
Basic, Northern	27.55
Standard Southern carwheels	51.60

Coke.—A producer in the Wise County district has advanced the price of foundry coke $1 per ton, making it $7.50 at oven. No fuel has been sold at this figure. It is understood that this action was taken by this interest because it had sold a round lot of furnace coke for future delivery. The demand for foundry coke is a little bit better and should the molders' strikes in this part of the country be settled at an early date, which now seems to be possible, this demand will increase. Connellsville 48-hr. coke is quoted around $4 per net ton at oven and 72-hr. from $5 to $5.50. Pocahontas foundry grades are around $6 to $6.50, and New River from $7 to $8.

High Speed Steel.—The past week was a more favorable one and selling agencies report a better business, especially from machine-tool makers. Leading brands are unchanged at $1.60 per lb.

Fluorspar.—The demand for gravel fluorspar is rather light, but that for ground fluorspar is very heavy. Washed gravel fluorspar is unchanged at $25 per ton at point of shipment.

Nonferrous Metal Scrap.—All prices on copper and brass scrap are very firm, but no advances within the past few days are to be noted. Lead is weak and is quoted around 3.75c. to 4c. Heavy copper ranged from 14c. to 14.50c; crucible copper, 14.25c. to 14.50c.; heavy red brass, 13.75c. to 14c.; light brass, 6c. to 7c.; red brass borings, 11.75c. to 12c., and yellow brass borings from 6.75c. to 7c.

Finished Material.—There is a little better demand for structural material, but taken as a whole, warehouse business in all lines is by no means up to normal. An exception may be noted in the demand for wire nails, which is improving. Mill agencies report also a heavy call for steel pipe and a continued improvement

in the demand for cold-rolled shafting. Rumors were circulated that prices on sheets have been shaded in the Pittsburgh district, but it is stated that these sheets were Government property and that they are now off the market. The inquiry for sheets is very good and sales are more numerous, as customers understand the usual custom of the mills to shut down during the hot period for repairs, may make it difficult to get shipments forwarded promptly later on. No. 28 galvanized sheets are quoted at 5.70c., Pittsburgh, with a freight rate to Cincinnati of 23c. per 100 lb.

The following are present local jobbers' prices: Steel and iron bars, 3.33c. base; bands, 4.03c. base; structural shapes, 3.43c. base; plates, ¼-in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c., and wire nails, $3.85 per keg base.

Old Material.—There is a much better feeling and transactions in all kinds of scrap are more numerous. As a consequence nearly all quotations have been advanced from 50c. to $1 per ton. The general opinion is that the market has reached the bottom and that it is now beginning to recover some of the losses made since the armistice was signed. There is a decidedly better demand for scrap from the steel mills both in this vicinity and in the Pittsburgh district. The following are dealers' buying prices in carload lots, f.o.b. yards, southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet	$10.00 to $10.50
Old iron rails	22.50 to 23.00
Relaying rails, 50 lb. and up	40.00 to 41.00
Rerolling steel rails	15.00 to 16.00
Heavy melting steel	13.50 to 14.00
Steel rails for melting	13.50 to 14.00
Old carwheels	16.50 to 17.00
No. 1 railroad wrought	14.50 to 15.00
Per Net Ton	
Cast borings	$6.00 to $6.50
Steel turnings	5.50 to 6.00
Railroad cast	16.00 to 17.00
No. 1 machinery	17.50 to 18.00
Burnt scrap	11.50 to 12.00
Iron axles	23.00 to 23.50
Locomotive tires (smooth inside)	14.00 to 14.50
Pipes and flues	12.00 to 12.50
Malleable cast	12.00 to 12.50
Railroad tank and sheet	9.00 to 9.50

British Iron at Fixed Prices

New Maximum Prices—Ferromanganese for Export Reduced—Large Tin Plate Order

(By Cable)

LONDON, ENGLAND, June 2.

The pig-iron market is firm and still advancing, with output sold, as already stated, to the end of June. As high as £8 5s. ($38.12) has been paid for Cleveland iron for export, and inquiry for forward shipment is increasing. Cleveland furnace owners have fixed maximum prices as follows for the domestic trade:

	£.	s.	d.	
Hematite	9	10	0	$43.89
Nos. 3 and 4 foundry iron	8	0	0	36.96
No. 4 forge	7	18	0	36.50
No. 1 foundry	8	4	0	37.88

Export prices all 5s. ($1.15) above these levels.

Makers are offering third quarter and second half at £8 for domestic delivery and at £8 5s. for export. Consumers all around are fairly well covered and are holding off for easier terms.

Ferromanganese for export has been reduced to £25.

The tin-plate market is quiet at 33s. The order for big oil size plates (referred to in last week's cable) has been taken by Wales at 32s. 6d. for 14 x 18¾-in. plates. There is a large inquiry for light plates for France, but business is difficult, owing to financial considerations.

American billets have sold at £13 10s. ($62.37), c.i.f. Manufacturers are hesitating to contract ahead because of increasing costs and the serious labor outlook.

The German steel production for April is expected to show a large reduction owing to strikes.

We quote per gross ton, except where otherwise stated, f.o.b. makers' works, with American equivalents figured at $4.62 for £1:

	£	s.	d.	
Pig iron:				
East Coast Bessemer	9	7	6	$43.32
West Coast Bessemer	9	5	0	42.74
Cleveland Nos. 3 and 4 foundry	8	0	0	36.96
Coke (Durham):				
Furnace	1	19	0	9.01
Foundry	2	4	0	10.17
Ferromanganese	25	0	0	115.50
Billets	14	10	0	67.00
Tin plate and sheet bars	13	15	0	63.53
Rails, 60 lb. and upward	15	0	0	69.30
				Per lb.
Steel bars	19	0	0	3.91c.
Large rounds, etc.	17	2	6	3.53c.
Structural material	16	10	0	3.41c.
Plates	17	10	0	3.60c.
Plates, boiler	19	10	0	4.02c.
Bar iron	20	10	0	4.23c.
Tin plates, 14 x 20, coke, 112 sheets, 108 lb., f.o.b. Wales	1	13	0	$7.62

(By Mail)

Shipbuilding Industry Very Busy—Zinc Refinery Abandoned—German Output

LONDON, ENGLAND, May 12.—Since the cessation of control business has been active and trading is gradually becoming more natural, but so far there is still a good deal of price confusion. In the foreign ore trade business is opening out slowly, consumers being reluctant to do business on the parity of the old freight basis. There are, however, good stocks in hand and users are adopting a waiting attitude in the hope of lower freights.

The shipyards continue busy with orders on hand, although at present prices there is not so much inducement for yards to lay down keels in anticipation of orders as in normal times. Present high prices are not conducive to enterprise on the part of owners of the smaller tramp steamers, but some good work is on hand for the larger lines. It is reported that Norway has placed some large orders for freight steamers on the northeast coast of England, the vessels ranging from 3000 to 7000 tons each. The yards generally have enough work on hand to keep them going for a considerable time, and it is reported that American shipping men who have been endeavoring to place orders for new cargo vessels in this country have returned in despair, not only on account of the difficulty in getting deliveries but also as to the question of terms. It is stated that Italian banks and shipowners have arranged the purchase of 155,000 tons of English shipping which will be distributed among Italian shipowners. Meanwhile, according to cable advices from Canada, an important change has been made in the government shipbuilding plans there, the great demand for ocean tonnage having influenced the government in continuing building and also the fact that the ships are easily saleable. It is reported that they could sell to Japan at a profit of £2 to £3 per ton.

An interesting, though regrettable, announcement has just been made to the effect that the National Smelting Co., which was putting up large works at Avonmouth with the intention of handling Australian zinc concentrates, has found it necessary to give notice to the workmen to finish contracts some days ago. The general increase in the cost of materials and wages, amounting to over 100 per cent since the buildings were originally started, has made this step necessary. The increases referred to make it impossible to construct an economic plant capable of meeting foreign competition. Should conditions generally become more favorable in the future, however, the work will be resumed.

According to reports reaching here from Germany the March output of pig iron there was 545,939 tons. The German steel position is unfavorable, and it is stated that at least half of the Upper Silesian furnaces are stopped owing to the want of ores. The Steel Works Union has been compelled to reduce prices for tees for Switzerland to 500 fr. ($82.50), while the rate for Denmark has been reduced accordingly. The French are stated to be cutting prices in Switzerland against deliveries from Lorraine through a new dealers' union composed of firms who do not belong to the German organization.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c.; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c.; mimimum carload 46,000 lb.; Denver, 99c.; minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs:

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.45c.

Wire Products

Wire nails, $3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50, and shorter than 1 in., $2.00. Bright basic wire, $3.15 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.00; galvanized wire, $3.70; galvanized barbed wire and fence staples, $4.10; painted barbed wire, $3.40; polished fence staples, $3.40; cement-coated nails, $2.85 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ per cent off list for carload lots, 59½ per cent for 1000-rod lots, and 58½ per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$3.70 base
Large boiler rivets.....$3.80
¼ in., 5/16 in. and 7/16 in. diam..65-10 and 5 per cent off list
Machine bolts, h.p. nuts, ⅜ in. x 4 in.:
Smaller and shorter, rolled threads..60-10-5 per cent off list
Cut threads.....60-5 per cent off list
Larger and longer sizes.....50-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter.....45-10-10 per cent off list
Larger and longer.....40-10-5 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.....60-5 per cent off list
Cut threads.....50-10-5 per cent off list
Larger and longer sizes.....45-10 per cent off list
Lag bolts.....65-5 per cent off list
Plow bolts, Nos. 1, 2, 3.....60 per cent off list
Hot pressed nuts, sq. blank.....3.25c. per lb. off list
Hot pressed nuts, hex., blank.....3.25c. per lb. off list
Hot pressed nuts, sq. tapped.....3c. per lb. off list
Hot pressed nuts, hex., tapped.....3c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....3.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped.....3c. per lb. off list
Semi-finished hex. nuts:
⅝ in. and larger.....70-10 per cent off list
9/16 in. and smaller.....80 per cent off list
Stove bolts in packages.....75-10-10-5 per cent off list
Stove bolts, in bulk.....2½ per cent extra
Tire bolts.....60-10-10-5 per cent off list
The above discounts are from March 28, 1919.
All prices carry standard extras. Pittsburgh basis.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52; chain rods, $60; screw, rivet and bolt rods and other rods of that character, $60. Prices on high carbon rods are irregular. They range from $65 to $75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, and small spikes, per 100 lb., $3.35 in lots of 200 kegs of 200 lb. each or more; track bolts, $4.35 per 100 lb. in carload lots of 200 kegs or more, and $4.90 in small lots. Boat and barge spikes, $3.85 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. from mill. Prices on bar iron are 2.35c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Butt Weld

Steel Inches	Black	Galv.	Iron Inches	Black	Galv.
⅛, ¼ and ⅜	50½	24	⅛ and ¼	29½	9½
½	54½	40	⅜	30½	3½
¾ to 3	57½	44	½	34½	16½
			¾ to 1½	39	23½

Lap Weld

2	50½	38	1¼	24½	9½
2½ to 6	53½	41	1½	31½	17½
7 to 12	50½	37	2	32½	18½
13 and 14	41	..	2½ to 6	34½	21½
15	38½	..	7 to 12	31½	18½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	46½	29	⅛, ¼ and ⅜	28½	11½
½	51½	39	½	33½	20½
¾ to 1½	55½	43	¾ to 1½	39½	24½
2 to 3	56½	44			

Lap Weld, extra strong, plain ends

2	48½	37	1¼	25½	10½
2½ to 4	51½	40	1½	31½	17½
4½ to 6	50½	39	2	33½	20½
7 to 8	46½	33	2½ to 4	35½	23½
9 to 12	41½	28	4½ to 6	34½	22½
			7 to 8	26½	14½
			9 to 12	21½	9½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts, which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel		*Charcoal Iron*	
3½ to 4½ in.	40½	3½ to 4½ in.	—18
2½ to 3¼ in.	30½	3 to 3¼ in.	— 1½
2¼ in.	24	2½ to 2¾ in.	+ 1
1¾ to 2 in.	19½	2 to 2¼ in.	+10
		1¾ to 1⅞ in.	+20

Standard Commercial Seamless—Cold Drawn or Hot Rolled

Per Net Ton		Per Net Ton	
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer

	Cents per lb
No. 8 and heavier	3.50
Nos. 9 and 10 (base)	3.55
Nos. 11 and 12	3.60
Nos. 13 and 14	3.65
Nos. 15 and 16	3.75

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15
Nos. 22 to 24	4.20
Nos. 25 and 26	4.25
No. 27	4.30
No. 28 (base)	4.35
No. 29	4.45
No. 30	4.55

Galvanized, Black Sheet Gage—Bessemer

Nos. 10 and 11	4.70
Nos. 12 and 14	4.80
Nos. 15 and 16	4.95
Nos. 17 to 21	5.10
Nos. 22 to 24	5.25
Nos. 25 and 26	5.40
No. 27	5.55
No. 28 (base)	5.70
No. 29	5.95
No. 30	6.20

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15
Nos. 17 to 21	4.20
Nos. 22 to 24	4.25
Nos. 25 to 27	4.30
No. 28 (base)	4.35
No. 29	4.40
No. 30	4.40
Nos. 30½ and 31	4.45

Non-Ferrous Metals

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
		Electro-	New	New	St.	New	St
May	Lake	lytic	York	York	Louis	York	Louis
28	16.75	16.50	72.50	5.20	4.95	6.57½	6.22½
29	16.75	16.50	72.50	5.20	4.95	6.55	6.20
June							
2	16.75	16.50	72.50	5.20	4.95	6.50	6.15
3	16.75	16.50	72.50	5.20	4.95	6.50	6.15

NEW YORK, June 3.

The markets are all quiet, but there is a moderate amount of buying in evidence. Interest in copper is a little stronger this week than last. The future of the tin market is still uncertain, although allocated stocks have diminished 50 per cent in the last month. The lead market is very quiet, with prices slightly easier. The spelter market remains stagnant and is lower. Antimony is strong.

New York

Copper.—After a week of relatively moderate buying the copper market has turned stronger, with demand more active than last week. This, however, has not been reflected in quotations, which are firm at 16.50c. to 17c., New York, for electrolytic with Lake 16.75c. to 17.25c., New York, both for June-July delivery. Most of the large producers are selling only on the basis of commitments taken for both June and July, and are extremely shy as to August delivery, for which they ask considerably more in case it is found expedient to make sales. It is generally conceded that the recent buying movement has been of very large proportions, the greater part of it for domestic consumption, very little being heard yet of export business of any size. Some producers claim that their output is as low as 30 to 40 per cent of capacity, but others say that it is at least 50 per cent of capacity with sales now about equal to production. There have been one or two sales by speculators of electrolytic copper at as low as 16.25c., New York, in the last week, but such transactions are said to be significant. The tone of the entire market is strong and healthy.

Copper Averages.—The average price of Lake copper in May, based on daily quotations in THE IRON AGE, was 16.18c. The average price of electrolytic was 15.93c.

Tin.—The only interesting news in the tin market has been the announcement by George Armsby, chief in charge of tin of the War Trade Board, that on June 1 there remained undistributed 1615 tons of allocated tin. This means a reduction in stocks of about 50 per cent since the first of May, and is taken to indicate that all of the allocated tin will have been distributed by July 1. There has been no reliable information as to when import restrictions will be removed. In the past week the market has been extremely quiet, and buying for future shipment when restrictions are removed has fallen off still further, although a little business has been done at 51c. to 51.50c. for shipments from the Straits.

Lead.—The market has again turned very quiet, the recent activity having subsided largely because consumers have filled their requirements for the present. There are a few sellers who have been shading the price of 5.25c., New York, of the leading interest and who have done some business at 5.20c., New York, or 4.95c., St. Louis, which we quote as the market.

Spelter.—Demand for spelter is still decidedly light, and the market is duller than at any time since the armistice, in the opinion of several producers. Not much improvement is expected until the steel and general situation change decidedly for the better. Prime Western for early delivery is quoted nominally at 6.15c., St. Louis, or 6.50c., New York, at which levels only a very small amount of business is reported. Even the export demand has subsided. Premiums are asked for delivery beyond June and interest in these positions is not strong.

Antimony.—The market continues strong, with wholesale lots for early delivery quoted at 8.37½c. to 8.50c., New York, duty paid, for Asiatic grades.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is quoted in wholesale lots for early delivery at 32c. to 33c., New York.

Old Metals.—The market is firm. Dealers' selling prices are nominally as follows:

	Cents per lb
Copper, heavy and crucible	16.50
Copper, heavy and wire	15.00
Copper, light and bottoms	13.25
Brass, heavy	11.50
Brass, light	8.50
Heavy machine composition	15.50
No. 1 yellow rod brass turnings	9.00
No. 1 red brass or composition turnings	13.00
Lead, heavy	4.75
Lead, tea	4.00
Zinc	5.00

St. Louis

ST. LOUIS, June 2.—The non-ferrous markets have been quiet with quotations at the close, car lots, as follows: Lead, 4.90c.; spelter, 6.15 to 6.20c. In less than car lots they were: Lead, 5.25c.; spelter, 6.40 to 6.50c.; tin, 72.50c.; copper, 16 to 17c.; Asiatic antimony, 8.50c. In the Joplin district the ore market is better, though the advance in prices is only about $1 per ton. However, second grades have ranged higher and thus improved the average for the district. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 7c.; heavy yellow brass, 9c.; light copper, 11c.; heavy red brass, 13.50c.; heavy copper and copper wire, 13.50c.; pewter, 35c.; tinfoil, 44c.; lead, 4c.; tea lead, 3c.; zinc, 3.50c.; aluminum, 18c.

Chicago

CHICAGO, June 2.—While there has been some buying of copper in restricted areas, there has been no general activity. There is no change in tin. Lead is weaker and has declined; the last advance was not justified by the demand and has practically stopped buying. There has also been a fall in the price of spelter; the recent advance was in sympathy with that in copper rather than a result of increased buying. Antimony has advanced ½c.; stocks are concentrated in a few hands and offerings are light. We quote copper at 17c. for carloads; tin, 72.50c.; lead, 5c.; spelter, 6.25c. to 6.30c.; antimony, 9c. to 9.50c. On old metals we quote copper wire, crucible shapes, 13.50c.; copper clips, 13c.; copper bottoms, 11.50c.; red brass, 13.50c.; yellow brass, 8.50c.; lead pipe, 4c.; zinc, 4c.; pewter, No. 1, 35c.; tinfoil, 37c., and block tin, 50c., all these being buying prices for less than carload lots.

Adding 10 per cent. of aluminum to nickel is claimed to bestow on the alloy a scleroscopic hardness greater than 55 which is necessary in a cutting tool. More aluminum, while increasing the hardness, cuts down its already deficient toughness. These points are claimed in patents (U. S. 1227846 and 1278304) granted to Hugh S. Cooper, Cleveland, for a substitute for high speed steel. By adding 2 to 3 per cent. of silicon to the Ni-Al alloy, the hardness is still sufficient while the grain is stated to be finer and the toughness increased. Adding from 1 to 15 per cent of zirconium to the ternary alloy gives the mixture a red-hardness and great toughness and forms an excellent cutting tool.

MAKING LESS PIG IRON

May Production 2,108,056 Gross Tons

Net Loss of 17 Active Furnaces Shown—Month's Production Nearly 40 Per Cent Less Than a Year Ago

The pig-iron production for May amounted to 2,108,056 gross tons or an average of 68,002 tons a day, as compared with 82,607 tons daily in April, 99,685 tons a day in March, and 111,175 tons a day in May, 1918. This is the lowest daily average since March, 1915, when 66,575 tons were made per day. There were only 195 furnaces in blast June 1, 29 having been blown out during May and 12 blown in. Six stacks operating on ferroalloys produced 14,604 gross tons, of which 11,157 tons was ferromanganese. On June 1 the estimated capacity of the 195 active furnaces was 68,100 gross tons as compared with 212 furnaces in blast May 1 with an estimated capacity of 75,860 gross tons.

Output by Districts

The accompanying table gives the production of all coke and anthracite furnaces for May and the three months preceding:

Pig-Iron Production by Districts—Gross Tons

	May (31 days)	Apr. (30 days)	Mar. (31 days)	Feb. (28 days)
New York	135,110	166,169	194,375	181,998
New Jersey	9,621	9,372	23,437	16,326
Lehigh Valley	72,660	72,155	90,086	74,970
Schuylkill Valley	53,861	54,755	81,683	85,644
Lower Susquehanna and Lebanon Valleys	43,797	39,334	49,743	48,724
Pittsburgh district	446,998	531,517	661,307	593,453
Shenango Valley	77,657	113,765	144,918	133,825
Western Pennsylvania	91,992	114,248	140,364	139,371
Maryland, Virginia and Kentucky	34,012	55,957	78,748	80,372
Wheeling district	46,799	82,641	115,104	120,908
Mahoning Valley	234,007	221,918	285,944	299,464
Central and Northern Ohio	208,059	268,784	319,768	286,015
Southern Ohio	59,132	51,998	48,820	46,015
Chicago district	344,390	416,009	532,511	510,763
Mich., Minn., Mo., Wis., Col. and Wash.	100,108	112,811	117,682	112,971
Alabama	137,169	149,708	182,845	185,570
Tennessee	12,684	17,077	22,908	23,779
Total	2,108,056	2,478,218	3,090,243	2,940,168

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, from May, 1918, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel Works	Merchant	Total
May, 1918	81,238	29,937	111,175
June	81,734	29,059	110,793
July	79,248	31,106	110,354
August	80,947	28,394	109,341
September	83,579	30,363	113,942
October	83,686	28,796	112,482
November	83,395	28,407	111,802
December	81,445	29,317	110,762
January, 1919	78,288	28,137	106,525
February	78,910	26,096	105,006
March	73,468	26,217	99,685
April	61,289	21,318	82,607
May	51,187	16,815	68,002

The figures for daily average production, beginning with January, 1913, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1913—Gross Tons

	1913	1914	1915	1916	1917	1918	1919
Jan.	90,172	60,808	51,659	102,746	101,643	77,799	106,525
Feb.	92,369	67,453	59,813	106,456	94,473	82,835	105,006
Mar.	89,147	75,738	66,575	107,667	104,882	103,648	99,685
Apr.	91,759	75,665	70,550	107,592	111,165	109,607	82,607
May	91,039	67,506	73,015	108,422	110,238	111,175	68,002
June	87,619	63,916	79,361	107,053	109,002	110,793	
July	82,601	63,150	82,691	104,017	107,820	110,354	
Aug.	82,057	64,363	89,666	103,346	104,772	109,341	
Sept.	83,531	62,753	95,085	106,745	104,465	113,942	
Oct.	82,133	57,361	100,822	113,189	106,570	112,482	
Nov.	74,453	50,611	101,244	110,394	106,859	111,802	
Dec.	63,987	48,896	103,333	102,537	92,997	110,762	

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of steelmaking iron month by month, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Total production			Spiegeleisen and ferromanganese		
	1917	1918	1919	1917	1918	1919
Jan.	2,244,203	1,756,208	2,430,022	38,792	30,695	32,787
Feb.	1,829,846	1,620,254	2,209,470	32,137	26,114	28,105
Mar.	2,285,430	2,349,419	2,277,507	36,563	39,122	26,644
Apr.	2,370,937	2,411,488	1,838,677	39,595	35,511	17,308
May	2404,380	2,513,577	1,586,805	37,701	54,633	14,604
June	2,304,155	2,407,166	.....	30,829	44,844	.....
July	2,369,630	2,456,693	.....	43,884	51,762	.....
Aug.	2,214,513	2,509,357	.....	39,492	54,009	.....
Sept.	2,198,705	2,507,381	.....	42,235	66,275	.....
Oct.	2,376,589	2,594,277	.....	48,691	70,379	.....
Nov.	2,349,545	2,501,867	.....	34,688	59,638	.....
Dec.	2,094,659	2,524,794	.....	29,902	49,435	.....

Furnaces blown in include one Lucy and Nos. 1 and 4 Aliquippa in the Pittsburgh district; Newcastle Nos. 1 and 2 in the Shenango Valley; one Youngstown stack in the Mahoning Valley; Portsmouth in southern Ohio; one Gary in Indiana, and two stacks of the Woodward Iron Co., and No. 2 Bessemer in Alabama.

Among the furnaces blown out are Harriet X and No. 1 Donner in the Buffalo district; Genesee in northern New York; Saucon in the Lehigh Valley; No. 1 Carrie and No. 1 Clairton in the Pittsburgh district; Alice in the Shenango Valley; Colonial in western Pennsylvania; one Virginia furnace in Virginia; No. 4 Mingo and both Riverside in the Wheeling district; one Central, one Columbus, one Cleveland, one Toledo and No. 3 National Tube in central and northern Ohio; one Federal and one Joliet in the Chicago district, Mayville stack B in Wisconsin, one Minnesota Steel in Minnesota, Alice in Alabama, Helen and La Follette in Tennessee.

Capacity in Blast June 1

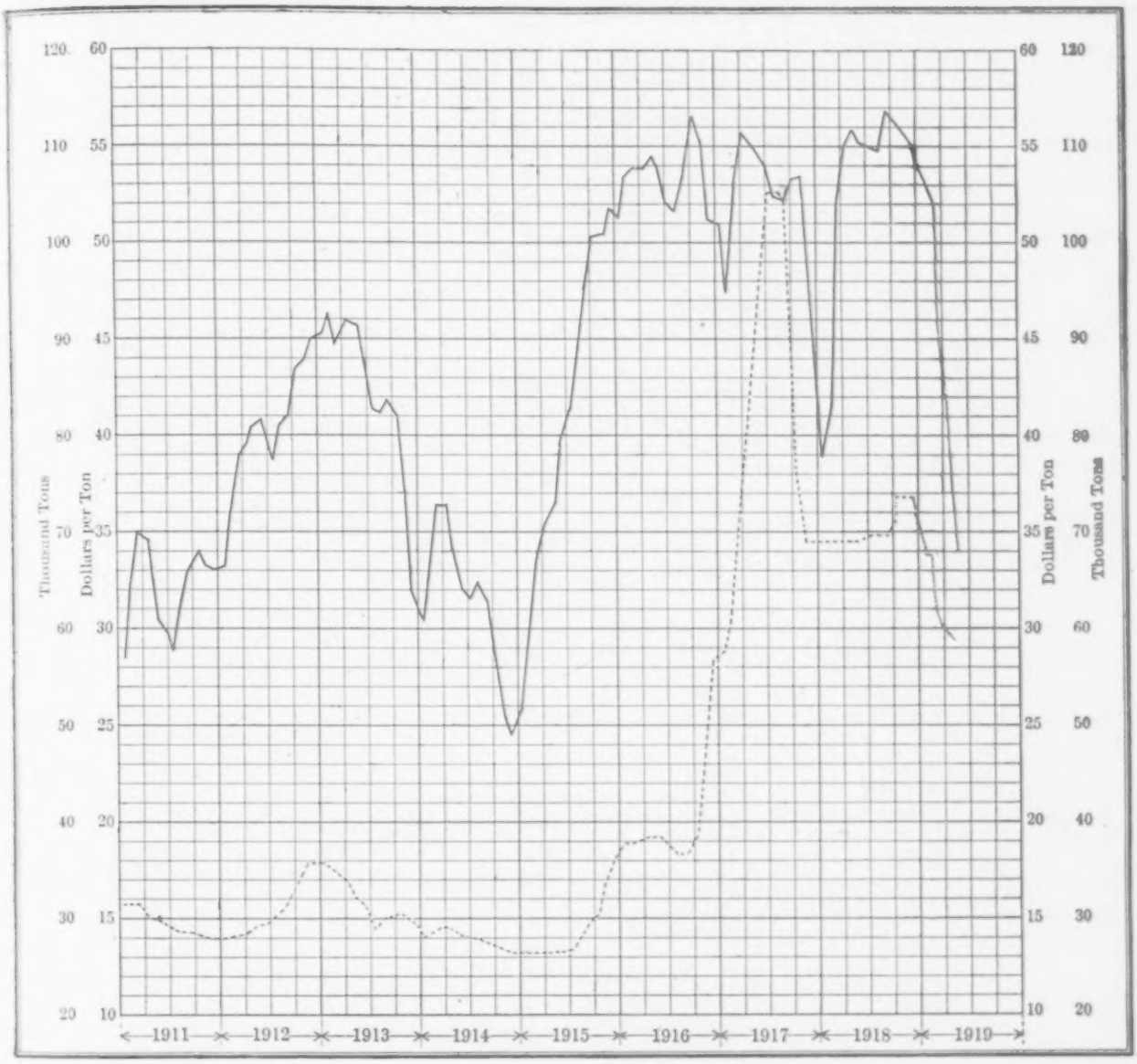
The following table shows the number of furnaces in blast June 1 in the different districts and their capacity, also the number and daily capacity in gross tons of furnaces in blast May 1:

Coke and Anthracite Furnaces in Blast

Location of furnaces	Total number of stacks	June 1 Number in blast	June 1 Capacity per day	May 1 Number in blast	May 1 Capacity per day
New York:					
Buffalo	22	10	3,500	12	4,610
Other N. Y.	4	1	195	2	485
New Jersey	5	2	310	2	310
Pennsylvania:					
Lehigh Valley	18	11	2,015	11	2,115
Spiegel	2	1	95	1	95
Schuylkill Valley	16	5	1,810	5	1,810
Lower Susquehanna	11	2	875	2	875
Lebanon Valley	6	2	365	2	365
Ferro and Spiegel	4	1	65	1	65
Pittsburgh District	52	33	15,500	32	15,440
Ferro and Spiegel	5	2	270	2	270
Shenango Valley	19	10	3,070	8	2,880
Western Pennsylvania	28	11	3,100	12	3,575
Maryland	4	1	360	1	360
Wheeling District	14	4	1,345	7	2,560
Ohio:					
Mahoning Valley	27	16	7,250	15	7,110
Central and Northern	26	14	5,755	12	8,390
Southern	17	10	1,710	12	1,730
Illinois and Indiana	40	25	12,400	25	12,805
Ferro	1	0	0	1	130
Mich., Wis. and Minn.	13	6	1,310	8	2,260
Colo., Wash. and Mo.	8	4	1,200	4	1,200
The South:					
Virginia	17	5	500	8	1,085
Kentucky	7	1	100	1	130
Alabama	44	15	4,650	14	4,580
Ferro	1	1	50	0	0
Tennessee	17	3	300	5	530
Total	428	195	68,100	212	75,860

Diagram of Pig-Iron Production and Prices

The fluctuations in pig-iron production from 1910 to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production by months of coke and anthracite iron. The dotted curve on the chart represents monthly average prices of Southern No. 2 foundry pig iron at Cincinnati, local No. 2 foundry iron at furnace



The Full Line Represents the Daily Production of Pig Iron and the Dotted Line Is the Average of the Price Per Ton of No. 2 Southern Pig Iron at Cincinnati, Local No. 2 Iron at Chicago and No. 2X Iron at Philadelphia

at Chicago, and No. 2 X at Philadelphia. They are based on the weekly market quotation of THE IRON AGE.

Production of Coke and Anthracite Pig Iron in the United States by Months, Beginning Jan. 1, 1915—Gross Tons

	1915	1916	1917	1918	1919
Jan.	1,601,421	3,185,121	3,150,938	2,411,768	3,302,260
Feb.	1,674,771	3,087,212	2,645,247	2,319,299	2,940,168
Mar.	2,063,834	3,537,691	3,251,352	3,213,091	3,090,243
Apr.	2,116,494	3,227,768	3,334,960	3,288,211	2,478,218
May	2,263,470	3,361,073	3,417,340	3,446,412	2,108,056
5 mos.	9,719,990	16,198,865	15,799,837	14,678,781	13,383,090
June	2,380,827	3,211,588	3,270,055	3,323,791	.....
July	2,563,420	3,224,513	3,342,428	3,420,988	.....
Aug.	2,779,647	3,203,713	3,247,947	3,389,585	.....
Sept.	2,852,561	3,202,366	3,133,954	3,418,270	.....
Oct.	3,125,491	3,508,849	3,303,038	3,486,941	.....
Nov.	3,037,308	3,311,811	3,205,794	3,354,074	.....
Dec.	3,203,322	3,178,651	2,882,918	3,433,617	.....
Total, yr.*	29,662,566	39,039,356	38,185,981	38,506,249	.....

*These totals do not include charcoal pig iron. The 1918 production of this iron was 347,224 tons.

Blast Furnace Notes

The Belfont Iron Works Co. expects to blow out its furnace at Ironton, Ohio, about June 10 for repairs and improvements which will require several months for their completion.

John B. Guernsey & Co., have rebuilt their Graham furnace at Graham, Va., which blew out on Jan. 1.

YOUNGSTOWN, OHIO, June 2.—Schedules are being maintained by iron and steel plants here with little variation. More blast furnaces are constantly being put in operation, however. On June 1 the Brier Hill Steel Co. lighted Tod furnace. The stack had been idle since early spring and was relined and overhauled. Neither of the other two furnaces at Brier Hill will be withdrawn for the present, although it is planned to reline Grace furnace. Twenty-six of the 46 blast furnaces in the Mahoning and Shenango valleys are operating this week, 16 in the Mahoning valley. In the two valleys four furnaces are banked and 16 are blown out. The latest furnace to come in blast in the Shenango valley is stack No. 3 in the Shenango group at Sharpsville, Pa. This furnace supplies molten metal to the Valley Mold & Iron Co. for the casting of ingot molds. The Carnegie Steel Co. put two furnaces at its New Castle, Pa. plant in blast May 30, bringing the number in operation in the group to three out of four.

The New York Testing Laboratories, which have been organized by L. R. Seidell, G. B. Jack, Jr., and H. H. Geist, formerly chief metallurgist, assistant chief metallurgist and chief chemist respectively of the Wright-Martin Aircraft Corp., have in addition to the laboratories at 354 Mulberry Street, Newark, N. J., opened up New York offices at 74 to 80 Washington Street. In addition to chemical and physical testing and microphotography, this organization is specializing in the source inspection of materials and as consultants in smelting, foundry, drop forging and heat-treating practices and the metallurgical investigation of shop troubles.

PERSONAL

The Buffalo Forge Co., Buffalo, announces that C. C. Cheyney has returned to take charge of its Chicago office and store. Lieutenant Cheyney was commissioned in the navy and had charge of the mechanical repair shops at the naval aviation station, Pensacola, Fla., where from 600 to 1200 men were employed during the war. Capt. H. H. Downes, 12th United States Railway Engineers, has returned from France and expects to take charge of the Buffalo Forge Co.'s interests in the St. Louis territory. Captain Downes' regiment was one of the first to go across, sailing in July, 1917.

John Frick has resigned as superintendent and designer of the machinery department engaged in work for the Horn & Hardart Baking Co., Philadelphia, to enter business for himself as a designer of tools and automatic machines, with offices in Philadelphia.

John De Wolf, formerly eastern sales representative of the Liberty Steel Co., has become associated with the Trumbull Steel Co., and will be with its New York office, Grand Central Terminal Building.

David W. Dunlevey has been appointed president of the Colonial Steel Co., Pittsburgh, succeeding John B. Finley, who died several months ago. Mr. Dunlevey has been identified with this organization since 1908, first as general superintendent and later as vice-president in charge of manufacturing. Prior to that he was with the Crescent Steel Co., Pittsburgh, now a subsidiary of the Crucible Steel Co. of America. The plant of the Braeburn Steel Co., Braeburn, Pa., was built under his supervision.

Theodore H. Sterling, New York, has been elected secretary and treasurer of the Standard Screw Co., Worcester, Mass., operating the Worcester Machine Screw Co., 79 Beacon Street, succeeding Solon C. Kelley, resigned. Charles E. Chase, Hartford, Conn., and Frederick B. Pearson, Miami, Fla., have been elected directors.

Henry C. Frick has bought the portrait of Col. Raynal C. Bolling, which is in the Knoedler Galleries exhibition of John Elliot's drawings of famous Americans killed in the war. It is understood that he will present it to the United States Steel Corporation, of which Colonel Bolling was general solicitor.

George W. Scott has been appointed by the Stark Rolling Mill Co., Canton, Ohio, district manager for the Chicago territory, with headquarters at 1119 Marquette Building. Mr. Scott has had a wide experience in sheets and fabricated products and was formerly Chicago representative of the Pittsburgh Steel Co. Thomas F. Murphy has been named district manager for the Canton territory. Mr. Murphy was connected with the American Sheet and Tin Plate Co.

W. L. O'Connell has resigned as manager of sheet sales for the Watson Brothers Steel Co., Youngstown, Ohio.

Arthur C. Lindholm, mechanical engineer with Colt's Patent Fire Arms Co., Hartford, Conn., has become general manager of the Franklin Machine & Tool Co., Springfield, Mass.

E. K. Thomas, formerly with the M. M. Granton Chemical Co., New Brunswick, N. J., has been made superintendent of the Hunter Saw & Machinery Co., Pittsburgh.

Roy A. Mason has resigned as assistant secretary of the Trumbull Steel Co., Warren, Ohio, to become associated with the new Victor Steel Co., same place, of which he will be the vice-president and general manager.

Jacob A. Teach has become contracting engineer, mechanical and structural departments, Minneapolis Steel & Machinery Co., New York. He has been chairman of the Minnesota section, American Society of Mechanical Engineers.

A. E. Walker has been appointed an assistant sales manager of the Republic Iron & Steel Co., Youngstown, Ohio, succeeding D. J. Geary, resigned, and will be located at the home office.

E. H. Ridgway, for 15 years with the Colonial Steel Co., Pittsburgh, and for 12 years its purchasing agent, has resigned, effective June 1, to become purchasing agent of the Struthers Furnace Co., operating a blast furnace at Struthers, Ohio. Mr. Ridgway will have his headquarters in the main office of the company in Cleveland. B. N. Trautman, for 10 years in the cost department, has been made purchasing agent, succeeding Mr. Ridgway.

William D. Ennis, acting professor of mechanical engineering at Columbia University, has been chosen professor of marine engineering in the post graduate department of the United States Naval Academy.

S. C. Orrell, recently manager of the Minneapolis office, Allis-Chalmers Mfg. Co., Milwaukee, has resigned to assume charge of the Chicago office of the Murray Iron Works Co., Burlington, Iowa.

B. F. Faunce, superintendent of the forge and wheel department of the Homestead steel works of the Carnegie Steel Co., Homestead, Pa., has resigned to accept a similar position with the Midvale Steel & Ordnance Co., Philadelphia. L. R. Custer, superintendent of the armor plate department of the Homestead steel works, has also resigned to accept a similar position with the Midvale Steel & Ordnance Co. L. J. Holman has been appointed to succeed Mr. Custer as superintendent of the armor plate department, and Ralph Mills has been appointed assistant superintendent to succeed Mr. Holman.

C. C. Thomas, who was sales engineer, service manager and a member of the experimental engineering department of the Denby Motor Truck Co., Detroit, has resigned to become chief engineer of the Fields Mfg. Co., Owosso, Mich., effective June 1.

H. M. L. Hunter has joined the Cincinnati sales force of the Jones & Laughlin Steel Co., Pittsburgh, and will travel in the Cincinnati territory.

George Wilfert, a discharged captain in the Ordnance Department, has become a consulting engineer on sporting rifles with the Remington Arms Co., Ilion, N. Y.

Judge Elbert H. Gary, chairman United States Steel Corporation, has bought Ivy Hall in the Wheatley Hills section of Long Island, the handsome estate of James B. Taylor. The property comprises 110 acres, with a fine brick residence and a private golf course.

Dan C. Swander, supervisor of sales the Standard Parts Co., Cleveland, and J. G. Utz, supervisor of engineering, headquarters for both of whom are at the executive offices in Cleveland, have been promoted to vice presidencies. Both have been with Standard Parts Co. from its beginning. Mr. Utz was formerly director of engineering in the Perfection Spring Co. and Mr. Swander was Eastern sales manager of the Firestone Tire & Rubber Co.

The Massey Concrete Products Corporation, Chicago, has opened an office in room 1405 Oliver Building, Pittsburgh, in charge of A. F. Humphrey. J. A. Higgs, Jr., has been made resident manager of the Massey Concrete Products Corporation at Atlanta, Ga.

Harold Prigoff has joined the machinery sales department, Syracuse Supply Co., Syracuse, N. Y., until recently having been assistant works engineer of the Savage Arms Corporation, Utica, N. Y.

R. S. Gifford, who has been with the Building Trades Employment Association, Cleveland, has been appointed secretary of the Founders Association of Cleveland, succeeding W. H. Bohn, who recently resigned.

V. V. Lebedjeff, president V. V. Lebedjeff Engineering & Supply Corporation, 227 Fulton Street, New York, will leave in a few weeks for an extensive trip in Europe. His good offices are volunteered without recompense for the furtherance of the interests of American manufacturers in the countries in which he will travel.

W. L. Niekamp, Beck & Corbitt, St. Louis; J. S. Proctor, Minneapolis Iron Store Co., Minneapolis; J. B. Carse, Ogden & Wallace, New York; J. I. Stephenson,

Cincinnati Iron & Steel Co., Cincinnati; C. W. Henderson, A. C. Harvey Co., Boston; Roy Hall, Inland Iron Co., Fresno, Cal., constitute the new executive committee of the American Iron and Steel and Heavy Hardware Association. This list contains one or two changes from that which appeared in THE IRON AGE of May 29 in the account of the association's recent convention at St. Louis.

The names of James Gayley, August Heckscher and T. I. Crane, all well known in the iron and steel trades, appear in the list of directors of the Alaska Mines Corporation, published in the past week.

Floyd W. Parsons, for a number of years editor of the *Coal Age*, New York, has accepted an important editorial place on the staff of the *Saturday Evening Post*, Philadelphia, having his office in New York, and will devote himself to the scientific and industrial features of that journal. R. D. Hall, who has been associate editor, succeeds Mr. Parsons in the editorial conduct of the *Coal Age*.

J. W. Gray has assumed the editorship of *Iron and Steel of Canada*, which until now has been jointly edited by Dr. Alfred Stansfield and W. G. Dauncey since its inception in February, 1918. Mr. Gray was educated in England and is a member of the Institution of Mining Engineers. Until recently he was assistant to the general manager, Dominion Steel Corporation, and then assistant to the president, Nova Scotia Steel & Coal Co. The editorial and printing offices have been removed to Ste. Anne de Bellevue, Canada.

M. L. Fellmer has been appointed secretary of the Safety Council of the St. Louis Chamber of Commerce, succeeding Carl Smith, who has been promoted from secretary of the Mississippi Valley Division of the National Safety Council to field secretary of the same organization. Mr. Smith has gone to Pittsburgh, where he will organize a safety campaign.

Stanley J. Quinn, secretary American Manufacturers' Export Association, from Jan. 1, 1918, to June 1, 1919, has resigned to accept a position with one of the members of the association. He will be succeeded by Robert F. Volentine, who has been active with the Brooklyn Chamber of Commerce.

Lieut. E. D. Stearns, until recently in the aviation service, has joined the H. K. Ferguson Co., Cleveland, as sales manager. Lieutenant Stearns is a graduate of the University of Illinois, 1907. For several years he was engineer and erection superintendent for the Stephens-Adamson Co., and was later manager of its New York branch. For six years previous to his military service he was a partner in the Fort Pitt Engineering Co., Pittsburgh.

F. I. Hutchinson, M. E., founder of the Heating & Power Equipment Co., Milwaukee, has severed his connection with the company and has opened offices at 1226 First National Bank Building, Milwaukee, as a consulting and designing engineer of heating and power plants, specializing in central station installations.

D. E. Sawyer, formerly with the Illinois Steel Co., and assistant steel director of purchases of the War Industries Board, has been appointed general manager of sales of the Pollak Steel Co., New York, with headquarters in the Equitable Building, 120 Broadway, New York. Mr. Sawyer will assume these duties on July 1.

Philip Wick was elected a director and vice-president of the Ohio Iron & Steel Co., Youngstown, Ohio, June 3, to succeed the late John C. Wick, who served the company for more than 40 years as a director.

Fred Tod, assistant general sales manager of the Brier Hill Steel Co., Youngstown, Ohio, has been elected a director of the company to fill the vacancy caused by the death of his brother, David Tod, on May 14.

F. Auberty, who has had charge of purchases of machine tools and allied lines for the French High Commission for the past four years, will return to France early in June. About 25 of his friends in the machinery trade recently gave a dinner for him at the Engineers' Club, New York, and he was presented a gold cigarette case.

OBITUARY

JAMES DAUGHERTY, 78 years old, died at his home at Steelton, Pa., on May 28. He was for many years superintendent of gas producers and reheating furnaces at the Steelton plant of the Bethlehem Steel Co. In the early 60's he assisted in producing the first open hearth steel produced in America. He retired ten years ago. John Webster Daugherty, president Pittsburgh Crucible Steel Co., and vice-president Crucible Steel Co. of America, a former general superintendent of the Steelton plant of the Pennsylvania Steel Co., is a son.

THOMAS H. BROOKS, for many years head of T. H. Brooks & Co., steel fabricators, Cleveland, died May 28, aged 73 years. He was born in Patriot, Ind., and was graduated from Williams College in 1870. For several years he was connected with the King Bridge Co., Cleveland, but left that company to establish the business of which he was the head. He retired 12 years ago. He was a member of the Union, Country, and University Clubs, Cleveland, and the Cleveland Chamber of Commerce.

FIRST LIEUT. JOHN R. MARCHANT was killed in action in France, Oct. 11, 1918. The announcement has been made by the Geo. F. Marchant Co., Chicago, by means of a card stamped with a gold star, and reading as follows:

Sept. 22, 1894 Oct. 11, 1918

First Lieutenant John R. Marchant, 131st Inf., A. E. F., A valued member of this organization and son of the president and founder, was killed in action near Gercourt, France

GEO. F. MARCHANT CO., Chicago

ERNEST M. LOCKWOOD, export manager Standard Steel Car Co., died May 30 at Redding, Conn., where he was visiting, at the age of 46. He formerly occupied a similar position with Deering & Co. His home was in New York.

CHARLES G. RICE, for the past five years superintendent of the Dover mill of the American Sheet & Tin plate Co., Dover, Ohio, died May 22, aged 43 years. He had been connected with the Dover plant 25 years, and started in the office as a clerk.

Number of Accidents Reduced

An interesting example of what may be accomplished in industrial safety work in a steel plant through the co-operation of all departments is had in the quarterly report for the first three months issued by the Safety Department of the Commonwealth Steel Co. of St. Louis and Granite City, Ill. A summary of the report follows:

	No. Accidents per 100 Men Employed
Average daily employment of men first quarter 1917, 2405	6.8
Average daily employment of men first quarter 1918, 2586	1.00
Average daily employment of men first quarter 1919, 1800	0.77

The United States Council of National Defense has approved the placing of the United States shield upon the red border of the service flag held by employers who give assurance that they will gladly take back their old employees who have served in the armed forces of the United States, but no names of individuals or business firms or companies shall appear anywhere upon the flag. Any employer who sends the required assurance to the War and Navy Departments through Colonel Arthur Woods, chairman of the Council's Emergency Employment Committee for Soldiers and Sailors, Washington, will be entitled to put the shield upon his flag.

Illinois Steel Co. Reorganizes Sales Department

CHICAGO, June 3—(*By Wire*).—The Illinois Steel Co. has reorganized its general sales department, effective June 1, creating three divisions of the department—the structural and plate division, the bar division, and the rail, billet and pig iron division. Each division is in charge of an assistant general manager of sales, who reports to the general manager of sales. The following appointments have been made to fill the new positions created: J. B. Arnold, assistant general manager of sales in charge of the structural and plate division; B. E. Hamilton, assistant general manager of sales, bar division, and P. W. O'Brien, assistant general manager of sales in charge of the rail, billet and pig iron division.

The company has established a department to be known as the Chicago district sales office, through which will be cleared sales originating in the territory comprising the northern half of Indiana and Illinois, Iowa, Nebraska, southern Wisconsin and the southern end of the Michigan peninsula. J. G. Carruthers, manager of sales of the Illinois Steel Co. at Cincinnati, has been transferred to Chicago and appointed manager of the Chicago district sales office.

Hillman Coal & Coke Co

Effective from June 1, the name of the United Coal Corporation, Pittsburgh, has been changed to Hillman Coal & Coke Co. The latter company on that date took over the jobbing department of the business of J. H. Hillman & Sons Co. and will carry out all of that company's unfilled orders and contracts covering sales and purchases of coal and coke. The officers of the Hillman Coal & Coke Co. consist of: J. H. Hillman, Jr., chairman of the board; T. W. Guthrie, president; A. B. Sheets, vice-president; Ernest Hillman, vice-president; Thomas Watson, vice-president and secretary; Robert W. Flenniken, treasurer; F. B. Lockhart, general manager of sales, and M. D. Flanigan, assistant general manager of sales. The offices are located in the First National Bank Building, Pittsburgh, and in addition the Hillman Coal & Coke Co. will temporarily use the offices now occupied by J. H. Hillman & Sons Co. in the Oliver Building. The present sales offices of United Coal Corporation in New York, Philadelphia and Baltimore and the sales office of J. H. Hillman & Sons Co. in Buffalo will be taken over and conducted by the new company.

Gathmann Ingot Mold Patents Upheld

Announcement is made by the Gathmann Co., Inc., of Baltimore, of the decree entered in the United States District Court for the District of New Jersey on May 24 in the patent infringement suit brought by the company against the Carnegie Steel Co. The court held that United States patents Nos. 921,972, 940,386, 974,133, 1,019,244, 1,188,751, 1,208,519 and 1,049,573 are good and valid in law. It is stated that the United States Steel Corporation has made a settlement for past infringement and has taken out a license for future use of these patents, which relate to ingot molds and processes for reducing ingot defects, such as piping and segregation. The patents are owned by the Gathmann Co., Inc., which states that in the past three years more than 2,000,000 tons of steel ingots have been produced by the Gathmann method under license from the company.

Donner Steel Co. Buys Tonawanda Stacks

The Donner Steel Co., Buffalo, has exercised the option which it held for the purchase of the property of the Tonawanda Iron & Steel Co. at North Tonawanda, N. Y., and acquired title to the two stacks of the last-named company which it has been operating under lease for the past three years. The North Tonawanda furnaces have been producing foundry, forge and malleable iron and have an annual output of 180,000 tons. They will continue to be operated as merchant iron furnaces by a subsidiary interest of the Donner company to be organized later.

The A Tonawanda furnace was built in 1873 and rebuilt in 1890-91 and has a 76 x 18 ft. stack. The B furnace was built in 1895 and is 80 x 18 ft.

With the acquisition of the Tonawanda plant the Donner Steel Co. now owns four blast furnaces.

Falcon Steel Co. Organized

YOUNGSTOWN, OHIO, June 2.—The Falcon Steel Co. has been formed with a capital of $2,500,000 by Lloyd Booth, C. H. Booth, Paul Wick, Myron C. Wick and John T. Harrington. The company will build a plant at Niles, Trumbull County, to manufacture tin plate and sheets. It is expected to be able to commence operations by Jan. 1, 1920. Lloyd Booth, II, treasurer, and Paul Wick, assistant general manager of sales of the Trumbull Steel Co., are the promoters. C. H. Booth was for many years chairman of the board of directors of the United Engineering & Foundry Co. The initial installation will involve expenditure of $1,500,000.

Chain for the Navy

UNIONTOWN, PA., June 2.—The Sligo Iron & Steel Co., having the only steel mill in the Connellsville coke region, was lowest bidder on 5,000,000 lb. of chain iron for the navy. In addition to this orders have been secured from other chain manufacturers for 1000 tons of iron per month. The navy order provides for 500 tons delivery per month. The Sligo company is now being overhauled to commence capacity operation upon its orders. The output of the mill is marketed through the Federal Export Co., New York.

To Sell Iron from Port Henry Furnace

Witherbee, Sherman & Co., who, as previously mentioned, will operate their own blast furnace at Port Henry, N. Y., now announce the appointment of M. L. Mozier, formerly of Perry Iron Co. and later of Wharton Steel Co., as representative in charge of pig iron sales, with offices at 2 Rector Street, New York. With their own ores to draw on, they will be in position to produce any grade of foundry or steel-making irons. Champlain has been chosen as the brand name.

Large Imports of Manganese Ore in April

Imports of manganese ore continue large. In April, this year, they were 59,470 gross tons as compared with 58,023 tons in April, 1918, and with 48,238 tons in March, 1919. The total for the first four months of this year has been 174,791 tons, or 43,698 tons per month. The average per month in 1918 was 40,942 tons per month. In the 10 months ended April 30, 1919, total imports have been 151,913 tons as against 173,510 tons for the same 10 months ended April 30, 1918.

Machinists Strike

CINCINNATI, June 3—(*By Wire*).—One hundred and fifty machinists struck at the plant of the William Powell Co., Monday, demanding a 48-hr. week, with 52½ hr. pay. Foundry molders in several shops are still out, but an agreement is expected before the end of the week.

Employees Will Decide

YOUNGSTOWN, OHIO, June 3.—Because city council has decided to turn back the clocks one hour on June 7 the question of abiding by the present hours or changing will be submitted to a referendum vote of employees of the Youngstown Sheet & Tube Co., under the representation plan.

J. Leonard Replogle, chairman of the board of the Wharton Iron & Steel Co., has confirmed the report that the Thomas Iron Co., Easton, Pa., has purchased a 400 acre iron ore field near Wharton, N. J.

Machinery Markets and News of the Works

HOLIDAY CHECKS BUYING

May Tool Business, However, Was Quite Satisfactory

Prices Are Being Fairly Well Maintained, Though Some Concessions Are Granted

In some lines of machine tools May business was quite satisfactory and a gradual improvement in orders and prospects is noted in nearly all markets. Business last week was somewhat quieter than the week before, due no doubt to the double holiday at the end of the week, many manufacturing plants shutting down Thursday night until Monday morning.

Machine-tool sellers report that the tendency of prices is toward greater firmness than was displayed several weeks ago, and it is stated that some manufacturers of engine lathes, who recently reduced prices 15 to 20 per cent, contemplate raising their quotations again. Though manufacturers' prices are being generally maintained, concessions are given occasionally by dealers, one instance of which occurred in the letting of orders by the Standard Oil Co. of New Jersey in New York last week, a dealer sacrificing a considerable portion of his commissions to obtain some of the business. The Federal Shipbuilding Co., Kearny, N. J., created a stir among radial drill manufacturers by reporting reduced quotations, but several manufacturers asserted they had made no reductions.

Continued expansion of the automobile industry still operates as an important factor in machine-tool demand. The Studebaker Corporation, South Bend, Ind., appears to be on the point of buying a list of tools in Cleveland, and scattered lots are being ordered by Detroit and other Michigan plants. The announcement that C. Harold Wills and John Lee, formerly of the Ford Motor Co., will build a large automobile plant and model town at Port Huron, Mich., has excited much interest. A site of 3000 acres has been purchased. An automobile of Mr. Wills' own design will be turned out.

Exporters of machine tools are disturbed by reports cabled by their French and Belgian agents that new and used machinery is being sold by the United States Government at price concessions which exclude American manufacturers from competing. A discount of 10 per cent has been offered on new tools, with liberal credit terms, in some cases extending over three years.

An auction sale of tools used by the Bethlehem Steel Co., Bethlehem, Pa., during the war will be held at Philadelphia June 11, and an auction of tools from the Frankford Arsenal, Philadelphia, will take place in that city June 12.

There were 10 bidders on the 22 large cranes for the naval ordnance plant at Charleston, W. Va. The Navy Department has not announced the awards. For the entire lot bids ranged from a minimum of $655,100 to $1,173,600.

New York

NEW YORK, June 3.

The Standard Oiil Co. of New Jersey last week placed orders for 50 or more machine tools and plate-working machines for its Bayway, N. J., repair shops, most of the business going to a dealer at a considerable concession in price. Several machine-tool manufacturers who had made quotations did not receive expected orders because they refused to cut their prices. The dealer who took the major part of the business did not cut manufacturers' prices but sacrificed a considerable part of his own commissions.

Buyers of tools are making efforts to obtain price concessions, but most machine-tool builders remain firm. The Federal Shipbuilding Co., Kearny, N. J., caused confusion among radial drill manufacturers last week by reporting that two or three of them had agreed to reduce their prices. Some of the radial drill manufacturers asserted they had made no concessions whatever, but one company accepted a price lower than its regular quotation and took the business.

The American Shell Co., Paterson, N. J., which will engage in the manufacture of centrifugal extractors and electric motors for washing machines has received quotations on a list of equipment and has stated that it will place orders this week.

The machine-tool business was quieter last week, due perhaps to the double holiday at the end of the week, many plants shutting down from Thursday night until Monday morning.

Inquiry has been made in New York for tools for the new valve manufacturing plant to be established at Redington, Pa., by the Bethlehem Steel Co. Most of the orders will probably be placed in Philadelphia.

Exporters of machine tools are somewhat disturbed by cable reports from their agents in France and Belgium that the United States Government is selling surplus tools, both new and used, in those countries at prices below those quoted by manufacturers. New tools are being offered at about 10 per cent below manufacturers' quotations, while second-hand tools are cut 25 per cent or more. The sale of certain lines of new tools from stocks carried by French and Belgian distributers of American tools has been seriously disturbed by the competition of the United States Government, which is offering liberal credit terms, spreading payments over three years if desired.

Inquiries and orders for cranes are slightly better. Crane manufacturers have been doing very little business since the war ended. The E. W. Bliss Co., Brooklyn, has ordered four wall cranes from the Shaw Electric Crane Co., which recently was awarded six overhead cranes by the same company. The Pratt Engineering & Machine Co., New York, has ordered two 10-ton bucket cranes from the Cleveland Crane & Engineering Co. The Standard Oil Co. of New Jersey is in the market for two 10-ton, one 20-ton and one 30-ton cranes for its repair shops at Bayway, N. J. The Mills Machine Co., Lawrence, Mass., wants four 10-ton hand power cranes, but it also is getting bids on electric cranes. The Baltimore & Ohio Railroad is inquiring for a 15-ton crane in addition to the 200-ton crane mentioned last week.

There were 10 bidders on the 22 electric traveling cranes for the new naval ordnance plant at Charleston, W. Va., as follows: Pawling & Harnischfeger Co., Milwaukee, Wis.; Niles-Bement-Pond Co., New York; Camden Iron Works, Camden, N. J.; Whiting Foundry Equipment Co., Harvey, Ill.; Alliance Machine Co., Alliance, Ohio; Morgan Engineering Co., Alliance, Ohio; Milwaukee Electric Crane & Mfg. Co., Milwaukee, Wis.; Chesapeake Iron Works, Baltimore, Md.; Cleveland Crane & Engineering Co., Wickliffe, Ohio; Manning, Maxwell & Moore, New York. All of the companies did not bid on the 22 cranes, some selecting only those types and sizes which they are especially equipped to build. On the 22 cranes complete the low bid of $655,100 was submitted by the Niles-Bement-Pond Co., while the high bid of $1,173,600 was submitted by the Alliance Machine Co., Alliance, Ohio. Bids were taken up to May 20 by the Bureau of Supplies and Accounts, Navy Department.

The Otto Heinemann Phonograph Supply Co., 25 West Forty-fifth Street, New York, manufacturer of phonograph motors, talking machine parts, etc., has filed plans for its proposed four-story plant at 140-70 Thomas Street, Newark, N. J., of reinforced-concrete, 80 x 340 ft., and estimated to

cost $325,000. A one-story power plant to cost $50,000, for work operation, will also be constructed.

P. J. McManus, Peoples Trust Co. Building, Binghamton, N. Y., and associates have acquired property at Lewis and State streets, for a machine-shop and automobile service works estimated to cost $30,000.

The Atlas Foundry Co., 206 Coit Street, Irvington, Newark, N. J., is planning a one-story addition, 60 x 100 ft., to cost $15,000, including equipment.

The Vreeland Motor Co., Newark, N. J., has acquired a building at 407-9 Elizabeth Avenue, for its initial plant for the manufacture eof motor trucks and parts. It will use the structure as temporary works, and plans to build a plant before the close of the year. E. E. Vreeland is president.

The American Aluminum Ware Co., 374 Jelliff Avenue, Newark, N. J., is planning for a three-story and basement addition, 37 x 50 ft.

The Jo-So Motor Co., Newark, N J., has been incorporated with a capital stock of $125,000 by Joseph S. Somer, Philip Niedermaier and Charles G. Somer to manufacture internal combustion engines. M. J. Tansey, 164 Market Street, is registered agent for the company.

The New Jersey Cutlery Co., 192 Market Street, Newark, N. J., has filed plans for its proposed one-story plant, 100 x 175 ft., at 692-700 South Sixteenth Street, to cost $30,000.

The D. P. B. Mfg. Co., 22 Pennington Street, East Orange, N. J., has filed notice of organization to manufacture crank pin turners, etc. Frederick P. Bollinger and Wilfred J. Peck head the company.

The Universal Garage & Machine Shop, 576 Springfield Avenue, Newark, N. J., has been incorporated with a capital stock of $25,000 by Harry Sevel, 113 Leslie Street; Louis Pristats, 202 North Clinton Street, and Joseph Klein, 44 Jones Street, East Orange.

The Jacob Brothers Co., 71 Warren Street, New York, manufacturer of scales, has increased its capital from $75,000 to $200,000.

H. W. Cotton, Inc., 233 Broadway, New York, manufacturer of special machinery, has awarded a contract to Fred T. Ley & Co., 19 West Forty-fourth Street, for the erection of a six-story plant, 200 x 500 ft., at Thirteenth Avenue Thirty-eighth and Thirty-ninth streets, Brooklyn, to cost about $1,000,000.

The Tite Grip Clutch Co., New York, has been incorporated with a capital stock of $10,000 by J., M., and L. Rosenberg, 24 Beekman Street, to manufacture safety clutches and grips for jewelry.

The Higdon Elevator Co., New York, has been incorporated with a capital stock of $10,000 by G. F. Higdon, E. A. Gilderson and J. McCahan, 507 West 138th Street, to manufacture elevator equipment.

The International Cork Co., 99 Sutton Street, Brooklyn, has increased its capital stock from $25,000 to $525,000.

The Cole-Duncan Boiler Works, 15 Clay Street, Brooklyn, is planning the erection of a one-story brick and concrete plant, 30 x 120 ft., on Borden Avenue, Long Island City.

The Holz Co., New York, has been incorporated with an active capital stock of $41,000 by H. A. Holz, Metropolitan Tower, H. A. Hensley and M. Cooper, Jr., to manufacture scientific instruments and apparatus.

The Webb Electric Furnace Co., New York, has been incorporated with a capital stock of $20,000 by J. G. Webb, H. T. and E. C. Gerdes, 30 Church Street, to manufacture electric furnaces and equipment.

A. S. Elliott & Co., New York, have been incorporated with a capital stock of $40,000 by A. S. Elliott, A. G. and S. Lichtenstein, 138 East 117th Street, to manufacture electric and gas fixtures.

The Aladdin Lamp Works, Inc., New York, has been incorporated with a capital stock of $15,000 by R. S. and J. G. Turnbull, and I. Castelli, 334 East Seventy-eighth Street, to manufacture electric lamps and equipment.

The National Snap Fastener Corporation, New York, has been incorporated with a capital stock of $100,000 by O. R. Lindgren, J. Herbert and W. Olson, 4077 Park Avenue, to manufacture metal specialties.

The Palmnut Corporation, New York, has been incorporated with a capital stock of $500,000 by L. F. Mentz, B. A. Weathers, Jr., and R. B. Scandrett, Jr., 454 Riverside Drive, to manufacture self-locking nuts, tools and machine products.

The Finelli Automobile Safety Fender Co., New York, has been incorporated with a capital stock of $400,000 by D. Mancusi, D. Napolitani and E. Finelli, 36 King Street.

The Bureau of Yards and Docks, Navy Department, Washington, is planning for a boat storage works at the Brooklyn Navy Yard, to cost about $45,000. The equipment will include two electric traveling cranes.

The National Foundry Co. of New York, 10 Sandford Street, Brooklyn, manufacturer of plumbers' supplies, has purchased 10 acres on Grand Street, Newton Creek section, and will build a plant to provide about 80,000 sq. ft. floor space.

The Martalex Mfg. Co., New York, has been incorporated with a capital of $10,000 by A. Ascher, M. Fogel and A. Kutz, 320 Broadway, to manufacture electrical devices.

The W. & L. Machine & Tool Co., 207 Canal Street, New York, has been dissolved.

Joshua Horrocks, Inc., 41 Schenectady Avenue, Brooklyn, operating an iron and wire-working plant, is planning for a two-story addition and alterations to cost $20,000.

The Utility File & Tool Co., Brooklyn, has been incorporated with a capital stock of $5,000 by L. Berger, R. J. and J. DeRing, 138 Calyer Street, to manufacture tools, files, etc.

The Reimers Mfg. Co., 517 West Forty-fifth Street, New York, manufacturer of electric heaters, has leased property at 507-13 West Fiftieth Street, for a new establishment.

The Perkins Marine Lamp Co., 1943 Pitkin Avenue, Brooklyn, has filed plans for a one-story extension, 25 x 50 ft.

Property of the Grosser Knitting Machine Co., 260 West Broadway, New York, will be sold by Francis P. Garvan, Alien Property Custodian, on June 5.

The Stentor Electric Mfg. Co., Inc., 68 Hunters Point Avenue, Long Island City, has filed notice of dissolution.

The Bound Brook Oilless Bearing Co., Main Street, Bound Brook, N. J., will build a two-story, brick and steel addition about 100 x 140 ft.

The American Materials Co., South River, N. J., has been incorporated with a capital stock of $50,000 by Bruce C. Davey, A. M. Hall and Max Nienstaedt to manufacture metal alloys, magnesite stucco, etc.

The plant of the Acme Mfg. Co., Boonton, N. J., used for the production of munitions during the war, has been purchased by Robert J. Metzger of the New Jersey Machinery Exchange, 21 Mechanic Street, Newark, N. J., for about $9,000.

The Auto Fuse & Carbon Co., 3338 Boulevard, Jersey City, N. J., has filed notice of organization to manufacture fuses for automobile use. Peter Brodsky heads the company.

The Drop Forging Co. of New York, Westside Avenue, Jersey City, N. J., manufacturer of wrenches, etc., has filed plans for a one-story brick addition to cost $18,000.

James Spence, Jersey City, N. J., operating a foundry at 921 Garfield Avenue, has filed plans for alterations to cost $6,000.

Property of the Schaeffer & Budenberg Mfg. Co., 338 Berry Street, Brooklyn, manufacturer of recording instruments, gauges, thermometers, etc., will be sold by Francis P. Garvan, Alien Property Custodian, on June 6.

The Parker Axle & Products Corporation, 19 West Forty-fourth Street, New York, manufacturer of internal gear axles, is taking steps to have its product manufactured, pending the establishment of its own plant. The device will be produced for axles of 1-ton rate, capacity to 6 tons. Lloyd W. Parker is president, B. W. Collins, vice-president and Werner C. Parker secretary and treasurer. Roger W. Hastings is chief engineer.

Philadelphia

PHILADELPHIA, June 2.

The Gwilliam Co., Philadelphia, has been incorporated with a capital stock of $10,000 to manufacture ball and roller bearings, machinery and other metal products. The incorporators are George T. Gwilliam, Union League, Philadelphia; John Gwilliam, Bloomfield, N. J., and Edgar S. McKaig, 2021 Spruce Street, Philadelphia.

The Williamsport Foundry & Machine Co., Williamsport, Pa., capitalized at $25,000, has been incorporated to carry on a general foundry and machine business. Hiram Keller, C. LeRoy Foulk and Ralph Foulk are the incorporators.

The Rex Garage & Supply Co., Harrisburg, Pa., which conducts a machine shop, has filed notice of an increase in capital from $15,000 to $30,000. L. L. Shettel is secretary.

The blacksmith and carpenter shop of the Eastern Steel Co., Pottsville, Pa., were totally destroyed by fire May 28. Both buildings, of frame construction, will be rebuilt without delay, it is understood.

The Safety Impulse Starter Co., Philadelphia, has awarded contract to Samuel Golder, 1001 Gailey Building, for a four-story plant, 28 x 60 ft., at Fifteenth and Carlton streets.

A one-story, brick and steel boiler plant, 54 x 90 ft., will be constructed by the Surpass Leather Co., Philadelphia, at its works at Ninth and Westmoreland streets.

Bailey, Banks & Biddle, 1218 Chestnut Street, Philadelphia, manufacturers of jewelry, etc., have awarded a contract to Irwin & Leighton, 126 North Twelfth Street, for the erection of a twelve-story reinforced concrete factory, 43 x 80 ft., at 1220-1224 Sansom Street, to cost about $230,000.

The Cirelligraph Co., 1227 Germantown Avenue, Philadelphia, manufacturer of phonographs, has increased its capital stock from $200,000 to $500,000.

The Diamond Expansion Bolt Co., 90 West Street, New York, has leased property at 126 North Tenth Street, Philadelphia, for a new local establishment.

The Liquid Carbonic Co., Chicago, manufacturer of soda fountains and equipment, has filed plans for its one and two-story plant, 60 x 100 ft., and 40 x 66 ft., on Weikel Street, near Tioga Street, Philadelphia, to cost about $26,000.

The American Insulation Co., Philadelphia, has closed negotiations with the Ordnance Department, Washington, for the sale of its three and four-story plant buildings at Stokley and Roberts avenues on a site 141 x 298 ft., for a consideration of $186,000.

The Penn Shipyards Corporation, Camden, N. J., has been incorporated with a capital stock of $1,000,000 by Samuel Edelman, Philadelphia; Robert D. Hughes, Camden; and David McKnight, Jr., Palmyra, to build vessels, engines and other ship equipment.

The W. H. Dollar Mfg. Co., North Front Street, Camden, N. J., manufacturer of metal novelties, etc., has commenced the erection of a two-story plant, 52 x 70 ft., to cost about $20,000.

The American Bridge Co., Pittsburgh, is reported to be planning for extensions and improvements at its Trenton, N. J., works. The work is said to be estimated in excess of $1,000,000.

S. B. Stein, Inc., Osceola, Pa., is planning for a new one-story machine shop and foundry to cost $200,000, including equipment.

The American Metal Co., 61 Broadway, New York, is planning the erection of a one-story addition to its plant at Langloth, Pa., 50 x 100 ft., to cost about $20,000.

The Light Railway Equipment Co., Ridley Park, Pa., has been incorporated with a capital stock of $5,000 by H. Alfred Ellis and Lewis Z. Noble, Ridley Park; and Edgar E. Haviland, Commercial Trust Building, Philadelphia, to manufacture railroad apparatus.

Buffalo

BUFFALO, June 2.

Construction of a foundry building, 80 x 100 ft., at East Ferry Street and the New York Central Railroad Belt Line, for Michael Hayman & Co., brass founders, has been let to the W. H. Dill Co., 153 Masten Street, at $25,000.

The Niagara Brass & Mfg. Co., Buffalo, has purchased the Holly Co. shops, Caledonia Street, Lockport, N. Y., for a brass foundry and machine shop, to which its Buffalo plant will be moved.

The Art Metal Construction Co., Jamestown, N. Y., is having plans prepared by Lockwood, Greene & Co., Boston, for reinforced-concrete additions to its plant No. 1.

The Cushing-Wellsville Co., Wellsville, N. Y., has been incorporated with a capital stock of $20,000 to manufacture tanks, heaters, etc. G. H. Hyde, E. E. Merson and C. Graves are the incorporators.

D. H. Burrell & Co., Little Falls, N. Y., manufacturers of dairy machinery, have filed articles of incorporation with an active capital of $1,050,000 to manufacture its regular line of equipment with other farm machinery. E. J., L., and D. H. Burrell, Jr., are the incorporators.

Fire, May 24, destroyed the foundry at the plant of the Onondaga Steel Co., Syracuse, N. Y., with loss estimated at $10,000. The building, located on East Water Street, is owned by the Caldwell & Ward Brass Co., and was damaged to the extent of $6,000; the machinery and equipment damage is estimated at $4,000. L. M. Newkirk is general superintendent.

The King Shipping Case Corporation, Syracuse, N. Y., is being organized with a capital stock of $750,000 to manufacture collapsible steel cases for shipping service. The case is the invention of Frederick C. King, who will be associated with the company. Others interested are Arthur N. Ellis, Levi S. Chapman, both of Syracuse; and W. H. Foxhall, Rochester. Until the company's proposed plant is ready for service, the specialty will be manufactured under contract.

The North Mfg. Corporation, Buffalo, has been incorporated with a capital stock of $25,000 by M. S. North, J. F. Stokes and A. C. McCarthy, Buffalo, to manufacture machinery and machine supplies.

The Farsea Motors Corporation, Buffalo, has been incorporated with a capital stock of $100,000 by J. W. Farrar, B. J. and A. M. Seaman, to manufacture motors and parts.

The Curtiss Aeroplane & Motor Corporation, foot of Churchill Street, Buffalo, will operate a section of its local works for overhauling and repair work in connection with the re-purchase of a number of airplanes and motors from the Government. The company has acquired 2176 airplanes and about 4600 motors, and will place all of the machines in operating service.

The Waring Motor Cultivator, Oswego, N. Y., has been incorporated with a capital stock of $125,000 by L. Quinlan, C. F. McDonald and H. E. Moyses, 1 East Thirty-third Street, New York.

The A. C. G. Tire & Rubber Co., Buffalo, has been incorporated with a capital stock of $250,000 by F. and C. Lombardo, and A. Cerace, to manufacture automobile tires and rubber goods.

The Rome Gas, Electric Light & Power Co., Rome, N. Y., has been granted permission by the Public Service Commission to issue bonds for $257,000 for proposed plant additions. The company has arranged for the purchase of a local site for a new gas and electric plant, estimated to cost, with machinery and equipment, about $246,000.

The O. R. Adams Mfg. Co., St. Paul Street, Rochester, N. Y., manufacturer of metal-working machinery, has increased its capital stock from $30,000 to $150,000.

Baltimore

BALTIMORE, June 2.

The Standard Oil Co., Baltimore, it is reported, will build 46 steel tanks at a cost of about $650,000.

The Davis Co., Galena, Md., has been incorporated with $25,000 capital stock to manufacture tin cans, roofing, etc. The incorporators are Chester T., Olin S. and James D. Davis, Jr.

The Maryland Baking Co., 319 North High Street, Baltimore, is in the market for a milling machine, upright drill, medium-sized power saw, shaper and other equipment.

The Columbia Peanut Co., Norfolk, Va., wants prices on 80 to 100-hp. boilers and Corliss engines.

The capital stock of the Steel Castings Corporation, Altavista, Va., has been increased to $75,000.

Prices on 100-hp. boilers are wanted by the Lafayette Window Glass Co., Clarkburg, W. Va.

The Cylinder Grinding & Machine Co., Savannah, Ga., wants prices on 16-in. lathes, power hack-saws, milling machines, gear cutters, tool-post grinders, 10-in and 12-in lathe chucks, tempering furnaces, 16-in. back-geared shapers, small air compressors, motors, drills, reamers, etc.

The Bowling Green Mfg. Co., Bowling Green, Fla., wants prices on 150-hp. boilers, 50-hp. engines and 50-kw. generators.

The Reinhard Motor Car Co., Baltimore, is planning a four-story factory, 40 x 110 ft., at Oak Street and North Avenue. LeRoy B. Rothschild, 1225 Sansom Street, Philadelphia, is architect.

The War Department, Washington, has authorized the construction of three artillery stations to cost about $2,500,000. The structures will be located at Savanna, Ill., and Port Clinton, Ohio, with cost estimated at $1,000,000 each, and at Aberdeen, Md., with estimated cost placed at $500,000.

The Morris Fertilizer Co., Third National Bank Building, Atlanta, Ga., is planning for a fertilizer plant on the Cape Fear River, near Wilmington, N. C., to be located on a 50-acre site recently acquired. The two main structures will be 225 x 400 ft., and 100 x 225 ft. The plant will have a capacity of about 75,000 tons of material per year, and with machinery and equipment, including electric-operated industrial railway system, is estimated to cost $500,000. The company is also planning for a new phosphate works at Bartow, Fla., to cost about $750,000. This plant will include buildings and electric power plant for works operation. The equipment for this latter structure will consist of two 1000-kw. steam turbines, four 400-hp. boilers, pumping machinery, and auxiliary apparatus.

New England

BOSTON, June 2.

A sharp improvement has come in the past fortnight in many lines of industry in Worcester, Mass., and vicinity. The Worcester works of the American Steel & Wire Co. report a decided change for the better, beginning about three weeks ago, at first gradual, and now accelerating in such a manner that the local management expects a really good business in the near future. The plants in Worcester are running full time, but with a much reduced working force as compared with that preceding the armistice. It is proposed to increase the number of men employed.

A change from very dull to very active is quite general in the New England textile industry. The mills were flat when war contracts were cut off. Now they have all the business they can handle, and the textile machinery industry, which centers in Worcester, is correspondingly active. The Crompton & Knowles Loom Works, Worcester, the Draper Co., Hopedale, Mass., and the Whitin Machine Works, Whitinsville, Mass., have felt the new demand and the same condition exists in all other textile machine shops; no exception being mentioned. This is very important to the machine tool trade, for textile machinery companies are good customers.

Machine tool builders are optimistic as to the immediate future. They are booking orders from widely varying sources.

The Windsor Foundry Corporation, Windsor, Vt., recently organized with a capital stock of $200,000, is planning for the construction of a new plant, 80 x 200 ft. It has acquired the plant of the Cooley-Wright Mfg. Co. for present operations.

The Ford Cord Rubber Co., Augusta, Me., has been incorporated with a capital stock of $1,000,000 by E. L. McLean, E. M. Leavitt and A. L. Fogg, to manufacture automobile tires and other rubber products.

The United Cutlery Co., 107 Franklin Street, Worcester, Mass., has been incorporated with a capital stock of $25,000 by Salim R. Mahfoud, R. E. Fyrberg and Namar Nabham, to manufacture cutlery specialties.

A two-story ice-manufacturing plant to cost about $200,000 will be constructed by the Home Brewing Co., Hallam Street, Bridgeport, Conn. It will be 63 x 104 ft., with two one-story wings, 30 x 70 ft.

The Jefferson Union Co., Lexington, Mass., manufacturer of pipe couplings, etc., has awarded a contract to H. D. Best & Co., 949 Broadway, New York, for the erection of its proposed new foundry at Lockport, N. Y.

The Liberty Auto Radiator & Fender Works, Bridgeport, Conn., has filed notice of organization to manufacture automobile radiators and other metal specialties. M. Orlick, 350 Stratford Avenue, heads the company.

The Standard Stamping Co., 88 Page Street, Providence, R. I., has filed notice of organization to manufacture metal stampings. W. J. Keith, 37 Reservoir Avenue, heads the company.

The National Equipment Co., 630 North Main Street, Springfield, Mass., manufacturer of farm equipments, has awarded a contract to the A. E. Stevens Co., 318 Main Street, for the construction of a three-story addition to cost about $100,000.

The Elliott Hydraulic Valve Co., Bangor, Me., has been incorporated with a capital stock of $1 000,000 by O. Skinner, A. P. Trask and E. H. Dakin to manufacture valves, oil and gas engines and other machinery products.

The L. A. Carpenter Pressed Metal Co., Cambridge, Mass., will erect a brick factory, 54 x 54 x 85 ft. Contract for the building has been let.

The American Hardware Co., New Britain, Conn., has invited figures on a five-story mill building, 50 x 120 ft.

A two-story, 60 x 200 ft., addition to the paper mill of Crocker, Burbank & Co., Inc., West Fitchburg, Mass., will be built at a cost of $100,000.

A four-story machine shop, 36 x 52 ft., is among the improvements for the Wauskanut Mills, Farnumsville, Mass.

The Visoloid Co., Leominster, Mass., is about to erect a two-story machine shop, 40 x 59 ft., to cost $12,000. The contract is awarded.

The Frank Mossberg Co., Attleboro, Mass., has awarded contract for a one-story factory addition, 60 x 240 ft., to cost $30,000.

A new one-story power house, 35 x 50 ft., will be built by the American Brass Co., Waterbury, Conn. It will cost $50,000.

Chicago

CHICAGO, June 2.

The market was less active during the past week, possibly because of the holiday. Orders in general were for one or two machines. The largest single purchase reported was five turret lathes. The Hohmann-Nelson Co., Eau Claire, Wis., newly organized to manufacture levels, testing instruments, etc., placed a small list of equipment, including two engine lathes, one bench lathe, one disk grinder, two drill presses, two plain grinders, one hack saw and one screw machine. The Consolidated Tool Equipment Co., a bankrupt firm of 360 East Grand Avenue, Chicago, held an auction sale May 29 of about 30 machines, including one hand screw machine, six engine lathes, two milling machines, one shaper, one back-geared drill press, two drill presses, one 36-in. power shear, a number of grinding machines, and miscellaneous equipment. Purchasing was confined to consumers, who paid not only more than dealers were willing to offer, but more than the latter would sell similar tools for. This is regarded by the trade as an encouraging sign.

Another indication that the present level of prices is not likely to be radically changed in the near future is the report that those engine lathe manufacturers who reduced prices from 15 to 20 per cent about a month ago contemplate raising their quotations again.

While few noteworthy orders were placed in the last week, inquiries are encouraging, some of them calling for as many as 15 machines. Engine lathes are particularly active.

The Bucyrus Co., South Milwaukee, Wis., is expected to place the list for which it has been inquiring, at any time.

An auction sale of an extensive list of equipment used in a plant of the Bethlehem Steel Co., Bethlehem, Pa., is advertised for June 11, at Philadephia. All bidders, according to report, will be required to deposit the full amount on machines which they desire to purchase. On June 12, tools used in the Frankford Arsenal will be sold at auction at Philadelphia and prospective purchasers will be required to make deposits of 20 per cent with their bids. These terms are regarded as unreasonable by dealers in this section, and it is unlikely that they will take much interest in the sales.

The Grip Nut Co., 122 South Michigan Avenue, Chicago, has taken bids on 240 tons of structural steel for a 106 x 300-ft. addition to its Chicago plant.

The Gill Mfg. Co., manufacturer of piston rings for automobiles, 351 West Fifty-ninth Street, Chicago, has purchased a tract on the right of way of the New York Central Lines, between Jeffery Avenue and Eighty-fourth Street, with a frontage of 1438 ft. on South Chicago Avenue. The site will be improved with a one- and two-story factory, the first unit of which will cost $100,000.

A. B. Coffin, architect, Dexter Building, Chicago, has received bids on a four-story factory, 90 x 161 ft., to be erected in Van Buren Street, near Cicero Avenue, for the Belden Mfg. Co., manufacturer of wire, 2300 South Western Avenue. The building will be of reinforced concrete construction and will cost $150,000.

The Cole Storage Battery Co., 219 East Twenty-fourth Street, Chicago, has purchased property at 2435-2439 Indiana Avenue, which will be improved with a factory to cost $10,000.

A. S. Alschuler, architect, 28 East Jackson Boulevard, Chicago, will receive bids June 4, on a one-story factory, 195 x 265 ft., to be constructed for the Hill Pump Valve Co. at Belmont and Knox Avenues. The project will cost about $100,000.

The Iron Mountain Co., a corporation recently organized to manufacture railroad supplies, has awarded a contract to the E. P. Strandberg Co. for the construction of a one-story factory, 110 x 400 ft., at 833-45 East Ninety-fifth Street, Chicago, to cost $90,000.

The Union Drop Forge Co., 358 West Grand Avenue, Chicago, has awarded a contract for the construction of a one-story factory addition, 44 x 65 ft., at 1652 to 1654 North Kostner Avenue. The estimated cost is $3,000.

The Peru Plow & Wheel Works, Peru, Ill., has awarded a contract for the erection of a plant addition, 40 x 60 ft.

The Howlett Construction Co., manufacturer of locomotive coaling stations, Moline, Ill., has been sold to the Bay City Foundry Machine Co., Bay City, Mich.

The Meadows Mfg. Co., manufacturer of washing machines, farm scales and miscellaneous farm machinery, Pontiac, Ill., plans the erection of an addition to contain 40,000 sq. ft. of floor space.

The Racine-Sattley Co., manufacturer of agricultural implements, Springfield, Ill., will soon commence the erection of a plant for the production of farm gas engines.

The Gary Screw & Bolt Works, Gary, Ind., will reconstruct the part of its plant recently damaged by fire.

The Iowa Malleable Iron Co., Fairfield, Iowa, plans the erection of a gray iron foundry to cost about $30,000.

The Linograph Co., manufacturer of typesetting machines, Davenport, Iowa, recently approved the immediate expenditure of $200,000 for the purchase of a building site and the construction and equipment of a new plant.

The Crescent Electric Supply Co., Dubuque, Iowa, has been incorporated with a capital stock of $50,000 to manufacture electrical supplies, wiring, fixtures, hardware, etc. The officers are, president, Titus B. Schmid, vice-president, A. J. Schmid, and secretary, T. F. Kelley, all of Dubuque.

The Reynolds Electric Co., 426 South Talman Avenue, Chicago, has filed plans for a new brick manufacturing plant at 2634-44 Congress Street, to cost $85,000.

The Iowa Malleable Iron Works, Fairfield, Iowa, has commenced the erection of a one-story foundry addition, 100 x 142 ft.

The Brictson Rubber Tire Co., Omaha, Neb., is planning the erection of a new works at Twenty-fourth and Pappelton Streets, for the manufacture of automobile tires. The plant will be two-story and is estimated to cost about $100,000. A. G. Brictson is president.

The Stover Mfg. Co., Freeport, Ill., manufacturer of hardware products, is taking bids for the construction of a new one-story addition, 77 x 460 ft., to cost about $150,000.

Cleveland

CLEVELAND, June 2.

The machine-tool business continues fairly good, although not quite as active the past week as in the previous week. New inquiry fell off somewhat, apparently being affected by the holidays, many plants being shut down from Thursday until Monday. The demand from the Detroit automobile field is holding up well. Local machinery houses made several small-lot sales and a machine-tool builder booked orders for 8 or 9 machines from that district the past week. Some definite inquiries have come from the Studebaker Corporation, whose large machinery requirements were announced some time ago. Export demand is light, but a local house has just received an inquiry from Japan for 15 to 20 tools aggregating $35,000 for a machine shop.

The Standard Parts Co., Cleveland, has sold its motor car heater department to the Perfection Heater & Mfg. Co., Cleveland. C. S. Pelton, for several years connected with the engineering and sales work of the Standard Parts Co., and E. L. Jones, also formerly with that company, are associated with the new firm.

The Hogan Foundry Corporation, controlled by Pittsburgh interests, has placed a contract with the A. A. Lane Construction Co., Cleveland, for a new foundry at Orville, Ohio, 100 x 200 ft.

The Carroll Foundry & Machine Co., Bucyrus, Ohio, recently taken over by Cleveland banking interests, has been reorganized, and C. F. Michael, president Ohio Crane Co., Bucyrus, A. G. Stoltz, and W. H. Picking, both identified with the same company, have been added to the board of directors. Mr. Michael has been elected president, Mr. Stoltz, secretary, and Mr. Picking, treasurer. W. E. Matthew, of Cleveland, continues as vice-president.

The Ohio Crane Co., Bucyrus, Ohio, is having plans prepared for the erection of an addition to its plant.

The Champion Spark Plug Co., Toledo, Ohio, will shortly begin the construction of a $750,000 plant at Windsor, Ont., to supply its Canadian trade. Plans have been completed and contracts probably will be placed shortly.

The E. M. Landis Co., Toledo, has been incorporated to take over the business of E. M. Landis, 6 North St. Clair Street, and to manufacture a new kerosene carburetor and automobile lock. A. J. Hilt and C. E. Shanteau, formerly with the Willys-Overland Co., have become associated with the Landis company as treasurer and secretary, respectively.

The Toledo Scale Co., Toledo, has taken over a portion of the plant of the Toledo Stove & Range Co., and in addition has commenced the enlargement of its factory.

The Alloy Parts Mfg. Co., Canton, Ohio, has been incorporated with a capital stock of $250,000 by John F. Blake, F. Miller, G. A. Anderson and others. It has not yet made announcement regarding its plans.

Announcement was made in Canton, Ohio, of the organization of the J. T. Tractor Co. with a capital stock of $1,000,000. It is stated that the company will probably have its factory and offices in Cleveland.

President W. H. Ramsey of the Alliance, Ohio, Chamber of Commerce, has announced that Cleveland interests have submitted a proposition to erect a $500,000 steel foundry in Alliance.

The Jewitt Enamel Co. is moving its plant from Jewitt to Bellaire, Ohio, and, it is stated, will build an addition.

The Hughes-Keenan Co., Mansfield, Ohio, will shortly begin the erection of a new plant for the manufacture of pressed steel stairs and ornamental iron work. The first unit will be 100 x 200 ft.

Detroit

DETROIT, June 2.

This district is experiencing a great industrial boom, due to the prosperity of the automobile and allied industries. With established concerns weeks behind in orders and new firms being organized, a general expansion is taking place, limited only by the shortage of labor, industrial unrest and the lack of houses. The demand for standard machines is greater than it has been since the war, according to dealers, who report a steady week by week increase. Deliveries have not changed materially.

The announcement of C. Harold Wills and John Lee, formerly of the Ford Motor Co., of the erection of the new automobile plant at Marysville, just south of Port Huron, Mich., has added to the optimism prevailing. The company will manufacture a car designed by Mr. Wills and has secured 3000 acres as a site for a plant.

Lack of housing accommodations throughout the State is being met by the organization of building corporations by business men and employers. Detroit has a company, Bay City is forming one, and Jackson has formed a co-operative stock company. Flint is meeting the situation through the construction of thousands of homes by the General Motors Corporation, which is also building houses in Saginaw and Lansing.

The labor situation was marked by but one serious additional strike the past week in Detroit, employees of the Studebaker Corporation walking out.

The Columbia Motors Co. has announced that it will immediately erect a new factory at Boyd Street and Fort Street West, on six acres purchased from the Detroit Seamless Steel Tubes Co. at a price reported to be about $200,000. The factory will contain 150,000 sq. ft. of floor space and will be completed by Jan. 1.

The Mutual Electric & Machine Co., Detroit, has purchased the three and one-half story reinforced concrete building at the corner of Fourth and Porter streets, formerly occupied by the Doble Detroit Steam Motors Co. Alterations and additions will be made to allow for ultimate floor space of approximately 100,000 sq. ft. The officers are: H. J. L. Frank, president; I. Blum, vice-president; Leon H. Frank, secretary, and F. M. Ferguson, treasurer. The company maintains sales offices and carries stocks in New York, Chicago and San Francisco.

The Puritan Machine Co., Detroit, has purchased the stock of the Detroit Axle Co.

The All-Power Truck Co., Detroit, is now located at 372-380 West Fort Street in a larger plant. It will produce 1000 trucks within the next few months.

The Adrian Castings Co., Adrian, Mich., is increasing its force to manufacture the Marshall automobile starter.

The General Motors Corporations is planning to treble the capacity of the grinding plant of the Michigan Crankshaft properties, Lansing, Mich., which it recently acquired.

The Homer Foundry Co., Homer, Mich., will shortly move to Coldwater, Mich.

The Frederickson Axle Co. will locate its plant in Benton Harbor, Mich.

The Turnsted Mfg. Co., Detroit, a subsidiary of the Fisher Body Corporation, has moved into a new plant where it has 100,000 ft. more floor space.

The Samp Mfg. Co., Detroit, has been organized to manufacture agricultural and contractor's machinery and tools. The organizers are Charles L. Samp, Herman E. Schultz and Sylvanus Eck.

The F. B. Electric & Mfg. Co., Detroit, has been organized to manufacture electrical and mechanical apparatus. The organizers are John W. Fitzgerald, Detroit; D. J. Burns, Bronxville, N. Y., and Albert J. Fisk.

The Michigan Copper Products Co., Detroit, has been organized to manufacture sheet copper and brass, automobile radiators, tubing, etc. The organizers are John D. Beebe, Watson Beebe and Ellsworth S. Bryant.

The Detroit Die-Cast Bearing Co., Detroit and Highland

Park, has been organized to manufacture machines, tools, implements, etc. The organizers are William J. McCarthy, Highland Park, Charles R. LeChair and Lees W. Chadwick.

The Chapman Engine Works, Marcellus, has been organized to manufacture internal combustion engines, portable forges, emery grinders, etc., tools and machinery. The organizers are Walter C. Jones, Frank W. Patch and Harvey E. Romig.

The Peninsular Steel Process Co., Detroit, has been organized for hardening and heat treating steel and other metals. The organizers are Robert M. Allen, J. F. Durkin and Henry Halvorsen.

A power plant for works service will be erected by the National Biscuit Co., New York, in connection with its new building at Detroit. Plans have been completed.

The Union Motor Truck Co., Bay City, Mich., has been incorporated in Delaware with capital stock of $1,500,000 by James R. Tainter, Howard P. Woodworth and George Beaulieur, all of Bay City, to manufacture motor trucks and parts.

The Maxwell Motor Co., Detroit, is taking bids for the erection of an addition to Building No. 17 at its works at Highland Park.

Cincinnati

CINCINNATI, June 2.

The total business received from all sources is not sufficient to absorb output and quite a number of standard machines are going into stock. Permits issued for new industrial works are conspicuous by their absence, although some concerns have resumed construction on plants that had practically been suspended since the armistice was signed. The Trailmobile Co., Cincinnati, has given orders to resume work on its plant in Oakley, and construction on the Ford plant at Hamilton, Ohio, is well under way.

The Incandescent Light & Stove Co., Cincinnati, has been incorporated with $50,000 capital stock by Paul J. Connolly and others. It is reported that it will take over the plant of a company in Oakley, bearing the same name, and which has not been in operation for some time.

The Cullen & Vaughn Co., Hamilton, Ohio, has sold its four-story planing mill on East Dayton Street, and is having plans prepared for a new factory that will greatly increase its present capacity. A number of new planing machines as well as other equipment will be installed in the new plant when completed. The Beckett Paper Co., purchaser of the old building, has no intention now of using the building for manufacturing purposes.

The Robbins & Myers Co., Springfield, Ohio, maker of electrical equipment, has purchased the site and factory buildings of the James Leffel Co., which will later be fitted up for the manufacture of electric fans and motors.

The James Leffel Co., Springfield, Ohio, maker of turbine waterwheels, whose present plant was sold to the Robbins & Myers Co., is having plans prepared for enlarging and fitting up the plant of the Columbia Planer Co., which it has acquired. Its present capacity will be more than doubled.

The contract for the new plant of the Henderson Tire & Rubber Co., Columbus, Ohio, has been let to L. R. Moor, Columbus.

The Columbus Commercial Body Co., Columbus, Ohio, has increased its capital stock from $25,000 to $50,000.

The Bremen Metal Stamping Co., Bremen, Ohio, has been formed to take over the plant of the Bremen Mfg. Co. The new company expects to begin the manufacture of automobile specialties at an early date.

The Eclipse Stove Co., Mansfield, Ohio, has increased its capital stock from $300,000 to $600,000 and will probably enlarge the capacity of its plant at an early date.

Guy V. Thompson, Portsmouth, Ohio, has purchased the plant of the Portsmouth Engine Co., which he will operate under the old name.

The Marion Machine & Foundry Co., Marion, Ind., is purchasing equipment for a recently completed machine shop addition.

The Holston River Power Co., Johnson City, Tenn., James B. Cox, president, recently organized, is planning for the construction of hydroelectric power plants on the Holston River, near Kingsport, to cost about $3,000,000. The company proposes to furnish electric power for industrial operation and other service at Kingsport, Johnson City, Bristol and other points.

The Joseph B. Hillson Garage, West Oak Street, Louisville, Ky., will build a new machine shop and service building, 50 x 55 ft., with extension 20 x 40 ft. A lathe, drill press, welding equipment, air compressor and other apparatus will be installed.

The American Mfg. Co., Chestnut Street, Chattanooga, Tenn., is considering plans for rebuilding its iron working plant recently destroyed by fire with loss estimated at about $50,000. It specializes in the manufacture of scoops, shovels and similar equipment.

The Chattanooga Arbor Press Co., Chattanooga, Tenn., recently incorporated, is planning for the establishment of works for the manufacture of arbor presses and other specialties. F. A. Hecker is president.

The Hercules Rubber Corporation, Cincinnati, has been incorporated in Delaware with a capital stock of $1,000,000 by Charles A. Steiger, H. M. Halfner and J. A. Robinson, all of Cincinnati, to manufacture rubber products.

Milwaukee

MILWAUKEE, June 2.

Business in the last week of May brought the total volume for the month to good proportions. Inquiries being received, together with business actually placed, is of a character to inject much hopefulness into the tone of the market. New orders are coming at a rate that requires the use of greater capacity than at any time since the early part of the year. The milling machine demand is active. While the automotive industries continue the heaviest purchasers, other lines of metal-working are coming into the market for tools. A significant feature is the revival of demand from the tractor trade.

The Briggs & Stratton Co., 1047 Louis Avenue, Milwaukee, manufacturer of ignition devices and general automotive specialties, has plans for an enlargement of approximately 100 per cent in capacity in the next three or four months. Herman J. Esser, architect, 402 Camp Building, is preparing plans for a five-story shop addition, 60 x 175 ft., with a wing, 21 x 70 ft., and a four-story office building, 69 x 120 ft., on Center Street and Louis Avenue. A considerable list of new machine tool and other equipment will be required. Construction will begin late in June so that the new facilities may become available by Oct. 1. In addition to increasing its output of automobile, truck and tractor specialties and accessories, the company will take over the manufacture of motor-wheel appliances for bicycles heretofore conducted by the A. O. Smith Corporation, Milwaukee, and otherwise enlarge its line of products. Frank W. Manegold is secretary and treasurer.

The Four Lakes Ordnance Co., Madison, Wis., manufacturer of 5-in. naval guns, has resumed operations after being closed since May 1 because of labor difficulties. The present working force numbers 50, and the company is advertising for 50 or more machinists and bench hands for gun boring and turning.

The Menasha Boiler Works, Menasha, Wis., has filed articles of incorporation with a capital stock of $50,000. The incorporators are William J. Hess, William A. Bruce and Arthur Strange. It will do a general boiler and structural business.

The Bell Mfg. Co., Beaver Dam, Wis., has been organized by B. Belling, C. S. Knapp and E. W. Schettler, to manufacture steel barn equipment, farm tanks, drinking fountains, etc. Temporary factory quarters have been established in the Schley Building, College and Burnett streets, pending the erection of a permanent plant in the coming year.

The Wisconsin Parts Co., Oshkosh, Wis., which has been organized with a capital stock of $500,000 to take over the business of the E. B. Hayes Machinery Corporation of that city, has perfected its organization by the election of the following officers: President and general manager, W. F. Rockwell; vice-presidents, J. F. Hayes and J. H. Wall; secretary, E. J. Dempsey; treasurer, Louis Schriber; director, J. G. Morris. Mr. Rockwell formerly was vice-president and production manager of the Torbensen Axle Co., Cleveland. The company will specialize in the manufacture of worm-drive motor truck axles and automotive parts. Plans for enlargement of the plant and equipment are under consideration.

The Winther Motor Truck Co., Kenosha, Wis., will issue additional common stock in the amount of $1,000,000 to increase the capacity of its factory, purchase new machinery and equipment, and to finance general expansion. Most of the issue has been subscribed. The company completed the first unit of its works in Kenosha early in March and intends to duplicate the building during the summer at an estimated cost of $150,000. Martin P. Winther is president.

The Galvanizing & Sales Co. of Milwaukee has been incorporated with a capital stock of $12,500 to engage in hot process galvanizing, tinning, etc. The incorporators are Roy-

dell E. Webster, Albert B. Houghton and Neele B. Neelen, attorney, 114 Grand Avenue, Milwaukee.

The Board of Education, Chippewa Falls, Wis., expects to be ready for bids June 10 or 15 for the construction of a three-story junior high and vocational training school, 100 x 182 ft., costing $200,000. The architects are Beers, Schlintz & Bailey, Chicago. P. T. Favell is secretary of the board.

The American Metal Parts Mfg. Co., Milwaukee, has been organized by Edgar Harum, Leon Smith and Arthur H. White, 311 Security Building, Milwaukee, to manufacture metal specialties and novelties. It has been incorporated with a capital stock of $150,000.

The Wisconsin Shipbuilding & Navigation Corporation, Merrill Building, Milwaukee, is receiving bids for the construction of buildings and the installation of machinery, cranes and other equipment of its proposed new plant at Kewaunee, Wis. J. W. Barber is secretary.

The Hamilton Mfg. Co., Two Rivers, Wis., manufacturer of special furniture, has broken ground for a new press room, 50 x 150 ft., as an addition to its metal-working department. Stamping, pressing and welding equipment will be installed. The improvements will cost about $110,000.

Indianapolis

INDIANAPOLIS, June 2.

The plant of the Parry Mfg. Co., Indianapolis, maker of automobile and truck bodies, has been sold to the New York banking interests which have taken over the Martin Truck & Body Corporation, York, Pa. The two companies will be merged under the name of the Martin-Parry Corporation. The Parry Mfg. Co. was founded more than 30 years ago.

The Stutz High Duty Fire Engine Co, Indianapolis, has been incorporated with $250,000 capital stock to manufacture fire apparatus. The directors are H. C. Stutz, E. G. Sourbier, F. H. Wheeler, Martin M. Hugg and W. N. Thompson.

The H. Clauss Cutlery Co., Tipton, Ind., has issued $100,000 of preferred stock, making the total capitalization $200,000.

The Atlas Axle Co., Gary, Ind., has been incorporated with $200,000 capital stock, to manufacture axles. The directors are W. H. O'Donnell, C. T. Bangs and C. A. Herring.

The Ohio River Hub Co., New Albany, Ind., recently organized, has broken ground for its new factory.

The Dean Brothers Steam Pump Works, Senate Avenue and West Tenth Street, Indianapolis, Ind., has awarded a contract to John A. Karstedt, Lemcke Building, for the erection of a one-story addition, 38 x 48 ft., to cost about $10,000.

The Wabash Tractor Co., Wabash, Ind., recently organized, will soon commence the erection of its new plant for the manufacture of auto tractors. It is proposed to have the works ready for occupancy early in August.

The Indianapolis Tool & Mfg. Co. has increased its capital stock from $10,000 to $75,000.

The Columbia Iron Works, Columbia City, has been incorporated with $20,000 capital stock to manufacture general foundry products. The directors are Frank L. Muers, Walter W. Williamson, Thomas L. Hindebrand, James Williamson and O. F. Menefee.

The W. L. Butcher Fence Protector Co., Flora, Ind., has been incorporated with $15,000 capital stock. The directors are William L. Butcher, William O. and William M. Harmon.

Pittsburgh

PITTSBURGH, June 2.

The Westinghouse Electric & Mfg. Co., Pittsburgh, is planning for the removal of its turbine and reduction gear departments from its local works to the Essington plant, near Philadelphia, as soon as this latter plant completes existing contracts with the Government for equipment for cargo and naval vessels. This will provide additional space for the manufacture of motors and general electrical specialties at the East Pittsburgh works. With present arrangement to establish operations for the production of industrial motors and automobile starting and lighting systems at the plant of the New England Westinghouse Co., East Springfield, Mass., additional space will be provided for other manufacture at the Pittsburgh plant as well as the works at Newark, N. J. It is expected to have the New England plant ready for operation by Sept. 1.

Fire, May 25, destroyed a section of the building of the Valley Supply Co., Pittsburgh, with loss estimated at $25,000.

The Pittsburgh Malleable Iron Co., Pittsburgh, has acquired the two-story building of the Keystone Axle Works at Thirty-third and Railroad streets. It is 79 x 120 ft., and will be used for plant extension.

The Jones & Laughlin Steel Co., Pittsburgh, has filed plans for a one-story boiler shop on Second Avenue, near Bates Street, to cost about $6,000.

The Carbon Steel Co., Pittsburgh, will be in the market shortly for a continuous furnace charger.

The Riter-Conley Mfg. Co., Pittsburgh, is reported in the market for a 30-ft. vertical boring mill and a vertical turret lathe with 42-in. swing, direct current motor-driven.

The Electric Appliance Co., Pittsburgh, has filed notice of an increase in capital stock of from $40,000 to $100,000. Fred Dennis is secretary.

The Nickel-Alloys Co., Pittsburgh, recently incorporated, has filed notice of an increase in indebtedness from $35,000 to $150,000. T. J. Patton is secretary.

The R. E. Loughney Motor Co., Pittsburgh, will increase its capital stock from $25,000 to $100,000. L. German, Jr., is secretary.

St. Louis

ST. LOUIS, June 2.

J. R. England, England, Ark., will equip a cotton gin requiring about $20,000 worth of machinery.

Morris & Co., Chicago, will increase the power plant equipment of its Kansas City branch.

The Black Bayou District Drainage Commissioners, Greenville, Miss., W. E. Wilson secretary, will equip a new pumping station.

The American Public Service Corporation, Abilene, Ark., will construct units of electric light plants costing about $350,000.

The Missouri Southeastern Utilities Co., Blytheville, Ark., will establish a central power plant for the distribution of electric current to nearby towns. About $450,000 will be expended.

M. R. Jones and others, Hugo, Okla., will erect a $50,000 flour mill, including a power plant.

B. Praeger, Howard Ave., New Orleans, La., will equip a machine shop requiring about $16,000 worth of machinery.

The American Scrubbing Equipment Co., Hannibal, Mo., will install power, heating and machine shop equipment for the manufacture of scrubbing machinery.

The Auto Spring Mfg. Co., Kansas City, Mo., will equip a plant for the manufacture of automobile springs. About $10,000 worth of machinery is wanted.

The Compound Container Co., Tulsa, Okla., will establish a plant to cost $50,000 to manufacture cans. John L. Smith, Claude L. Bruce and others are interested.

The St. Joseph Warehouse & Cold Storage Co., St. Joseph, Mo., will equip a mechanically operated unloading dock at a cost of about $20,000.

The Southwestern Gas & Electric Co., main office 111 West Monroe Street, Chicago, will equip repair, blacksmith, machine and wood-working shops at Texarkana, Ark.

The K. C. Hay Press Co., foot of Fourth Street Viaduct, Kansas City, Mo., will equip a two-story factory, 150 x 320 ft., for the manufacture of hay presses.

Morris & Co., Chicago, will install a 300-ton ice machine in the packing plant at St. Joseph, Mo., rebuild the water condenser and add other machinery.

The Hollandale Gin Co., Hollandale, Miss., recently organized with a capital stock of $30,000, will build a new plant. It will have a capacity of about 100 bales per day and be equipped with an oil-operated engine. C. D. Walcott is president and manager.

J. O. White & Son, Winston-Salem, N. C., are planning for the construction of new works for the manufacture of automobile parts, etc.

The Marine Equipment Co., Mobile, Ala., manufacturer of anchors, winches and other marine products, is planning for the installation of additional machinery.

Texas

AUSTIN, May 31.

The Dallas and Houston plants of the Mosher Mfg. Co. will be enlarged by the erection and addition of buildings and equipment to cost $250,000. About 500 workmen will be employed in the two plants when the extensions are completed, according to W. S. Mosher. Standard and rotary drilling machinery and big irons for deep well rigs will be manufactured.

R. L. Lewis, secretary Chamber of Commerce of McAllen, will build a four-stand gin to cost approximately $15,000.

It is announced by Frank Horn, west Texas manager for

the Island Oil & Transport Co., Tampico, Mexico, and New York, that his company will equip three new refineries, one on the Texas gulf coast, one in Cuba and the other to be located south of Tampico in Mexico.

The machinery of the automobile factory now being operated by the Southern Motor Mfg. Corporation at Bowling Green, Ohio, will be transferred to the plant at Houston, which will have a capacity of 10 trucks per day. E. F. Reid is vice-president.

The proposed new plant of the Mack Oil & Water Well Screen Co., Kress Building, Houston, will consist of three reinforced-concrete buildings, 100 x 200 ft., 75 x 100 ft., and 30 x 50 ft., and is estimated to cost about $200,000. Much of the equipment will be operated by individual electric motors. J. O. Mack is manager.

The Gorman Home Refining Co., Gorman, Tex., has acquired about 25 acres and plans for the construction of a new oil refinery with daily capacity of about 3000 bbl. The company has an operating capital of $375,000. J. T. Neill is president.

The American Refining Co., National Bank Building, Wichita Falls, is planning for the installation of additional equipment at its refinery.

The Pittsburgh-Texas Oil & Gas Co., Pittsburgh, recently organized with a capital stock of $5,000,000, is planning to double the capacity of the 1500 bbl. oil refining plant acquired from the Benedum-Trees Co. in the Texas oil district. It is proposed to effect a daily capacity of 3000 bbl. G. J. Wolf is vice-president and J. L. Mullen, secretary.

The Four Sevens Automobile Co., Houston, is planning for the erection of new works for the manufacture of automobiles and parts to cost about $45,000. The company has recently increased its capital from $60,000 to $300,000.

The Pacific Northwest

SEATTLE, May 27.

General manufacturing is showing considerable activity A few new plants are being erected, and there is a fair demand for equipment of all kinds. Second-hand machinery is very scarce and is eagerly picked up.

The Portland Rubber Mills, Portland, has awarded contract for its proposed new factory, the main building to be one-story, 75 x 200 ft., costing $20,000. An additional $15,000 will be expended for equipment. H. C. Huntington is president.

It is reported the Montana Cord Tire Co., Great Falls, Mont., with a capital stock of $500,000, plans the construction of a factory to manufacture cord tires. Felix C. Plouf is president.

The Everett Granite Co., Everett, Wash., capitalized for $100,000, will develop a granite quarry near Granite Falls. Equipment will be ordered at once.

The Concrete Pipe Co., Seaboard Building, Seattle, is erecting a pipe manufacturing plant on Lake Washington, the main building to be 60 x 100 ft. It will make only concrete pipe at first but will later turn out all forms of concrete products, including blocks and anchors. The initial unit will have daily capacity of 800 ft. of concrete pipe. R. A. Ballinger, Seattle, is president.

The Kelso Machine Works, Kelso, Wash., has been organized by Wood & Wells, who will equip a shop.

Canada

TORONTO, June 2.

The machine-tool trade is picking up and dealers are more optimistic than at any time since the signing of the armistice. Considerable interest is shown in the placing of orders for equipment for the St. Malo shops of the Canadian National Railways, Quebec. Lists now out call for an expenditure of about $750,000 and include about 75 tools. This is the best business offering at present, although the automobile trade will shortly come into the market. In certain lines of machinery quite a scarcity exists. It is impossible to secure chucks on short notice and one concern was notified that about two months was the shortest period in which delivery could be promised. The Imperial Munitions Board and the Canadian Aeroplanes, Ltd., are still putting used machinery and tools on the market. The list which the Canadian Aeroplanes, Ltd., Dufferin Street and Lappin Avenue, Toronto, has to dispose of includes: 1 No. 3 Garvin and 5 Whitney hand millers; 4 drill presses; 2 power hack saws; 2 No. 24 Bellevue furnaces; one 12 x 12 Sullivan air compressor; 1 No. 730½ Brown Boggs press; Nos. 1, 2 and 4 Warner & Swasey screw machines; Nos. 1, 2 and 4 Foster screw machines; 1 in., 12-in., and 16-in. Yates buzz planers; 1 Hayes single end tenoner; 1 American carving and friezing machine, combined; one 15-in. single knife Whitney wood scraping machine; one schelerescope, and several other machines. The British Forgings, Ltd., Toronto, has for sale by the Imperial Munitions Board, 56 Church Street, the following equipment: 5 Dean hydraulic pumps, complete; four 300-ton Mesta hydraulic presses, complete; two 18-ft. accumulators, complete; 2 No. 11 Sheldon cupola blowers, etc.

A permit has been taken out by William Neison, Ltd., for the erection of a $250,000 factory at 277 Gladstone Avenue, Toronto.

Plans are in progress for the erection of a factory at Hamilton, Ont., for the Hoover Suction Sweeper Co., North Canton, Ohio. The engineers and architects are Mason & Hoover, 157 Railway Exchange Building, Chicago, Ill.

The Lague Heating Systems, Ltd., 56 St. Patrick Street, Lachine, Que., will build a factory and is in the market for machinery and tools for the manufacture of water heaters, etc.

The Toronto Butchers & Supply Co., 61 Ossington Avenue, Toronto, will build a factory to cost $50,000. Hutchison & Wood, Royal Insurance Building, Montreal, are the architects.

P. H. Secord & Sons, 133 Nelson Street, Brantford, Ont., have the general contract for the erection of a factory at Guelph, Ont., for the Northern Rubber Co., to cost $100,000.

The Municipal Council, Roberval, Que., will make repairs to its hydroelectric power plant at a cost of $20,000 and is in the market for one 300-hp. horizontal shaft turbine, head 50 ft., speed 600 r.p.m.; also one 250 k.v.a., alternating current generator, exciter switchboard. J. F. Trenton, Chicoutimi, Que, is the engineer

The Canadian Tank & Pump Co., Ltd., Toronto, has been incorporated with a capital stock of $50,000 by John D. Copeland, 103 Balmoral Avenue; Frederick H. Pratt, 444 Manning Avenue; Donald McDougall and others, to manufacture self-measuring pumps, tanks, pumping equipment machinery, etc.

The Place Viger Terminal Cold Storage, Ltd., Montreal, has been incorporated with a capital stock of $1,000,000 by Joseph M. Cabana, Joseph A. Lafrance, Alcide Chausse and others to manufacture machinery used in the manufacture of artificial ice, etc.

The Hamilton Lamp Co., Ltd., Hamilton, Ont., has been incorporated with a capital stock of $300,000 by Lyman Lee, Thomas H. Simpson, Reba Myers and others to manufacture electric lamps, electrical equipment, fixtures, machinery, etc.

Crandall, Carpenter & Read, Ltd., Vancouver, B. C., has been incorporated with a capital stock of $25,000 by Elmer E. Crandall, Wendell B. Farris, both of Vancouver, B. C.; Clarence E. Read, Calgary, Alta., and others to manufacture machinery, implements, etc.

The Snyderfiba Barrel & Box Co. Ltd., Montreal, has been incorporated with a capital stock of $200,000 by Errol Languedoc, Ralph E. Allan, Jean P. Charbonneau and others to manufacture barrels, boxes, etc.

The Everlastic Corporation, of Canada, Ltd., Granby, Que., has been incorporated with a capital stock of $50,000 by Pierre E. Boivin, Hormidas E. Comtois, Alonzo J. Lemieux and others of Granby, to manufacture rubber goods, etc.

The plant of the Imperial Steel & Wire Co., Collingwood, Ont., was totally destroyed by fire May 25, with a loss to building, machinery and stock, amounting to $200,000. It had been in steady operation throughout the war, and was recently shut down for overhauling. Col. J. A. Currie, M.P., Toronto, is president, and Dr. D. McKay, Collingwood, secretary-treasurer. It is expected that the plant will be rebuilt.

Government Purchases

WASHINGTON, June 2.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, schedule 4059, 1 steam forging hammer for Washington, opening June 17; schedule 4064, 1 motor-driven squaring shears for Mare Island, opening June 20; schedule 4065, 1 steam drop hammer for Boston, opening June 20; schedule 4069, 2 planers, 48 x 36-in., for Washington, opening June 10; schedule 8039½, 1 vertical testing machine for Washington, opening June 10.

NEW TRADE PUBLICATIONS

Stoker Improvement.—Combustion Engineering Corporation, 11 Broadway, New York. Pamphlet. Illustrates and describes an improved dumping arrangement for the company's type E stoker. It consists of square bars in place of the former trunnion design.

Electric Steam Signal System.—C. M. Loysted & Co., Seattle, Wash. Pamphlet. Describes a steam whistle electrically operated by push-buttons or from a switchboard and intended for signalling purposes for shops, mills and factories.

Spiral and Lap Welded Pipe and Corrugated Furnaces.—American Spiral Works, Chicago. Catalog, 87 pages, 8 x 10½ in., with stiff cover. Concerned with spiral riveted pressure pipe, lap welded steel pipe, forged steel pipe flanges, and corrugated furnaces for land and marine boilers. The catalog is profusely illustrated, numerous commercial applications being shown.

Crucible and Electric Furnace Steel.—Simonds Mfg. Co., Fitchburg, Mass. Catalog. Devoted to the company's output of crucible and electric furnace steel. A number of useful tables giving the weight per lineal foot of bar steel are included.

Steam Power Plants.—Murray Iron Works Co., Burlington, Iowa. Catalog 85, having 95 pages, 11 x 7¾ in. Illustrations with descriptions and specifications of Corliss, marine, pumping and vertical engines; air compressors; tubular, marine, portable and water-tube boilers; and rocking grates.

Rubber Stamps.—Bunting Stamp Co., 713 Liberty Avenue, Pittsburgh. Booklet. Gives sample reproductions from rubber stamps.

Wire Rope.—Broderick & Bascom Rope Co., St. Louis. Booklet, called the "Yellow Strand Joke Book." Shows numerous applications of the company's wire rope. About half the booklet is devoted to jokes.

Used Machinery.—Graves Machinery Exchange, 50 Church Street, New York. A stock list with illustrations of used machine tools and metal working machinery.

Bucket Cranes.—Whiting Foundry Equipment Co., Harvey, Ill. Folder. Views of installations of different types of bucket cranes with a list of users.

Sand-Blast Equipment.—Pangborn Corporation, Hagerstown, Md. Folder. Shows views of hose, barrel, revolving table and cabinet sand-blasts, also views of steel and brass castings and forgings before and after cleaning.

Electric Traveling Cranes.—Chesapeake Iron Works, Baltimore, Md. Catalog. Photographs and explanations of crane mechanisms and numerous views of commercial crane installations.

Superheaters.—Locomotive Superheater Co., 30 Church Street, New York. Bulletin T-2. Describes a superheater for stationary power plants. Line drawings showing the adaptability of the superheater to Heine, Springfield and Stirling type boilers are included

Capacity Bridge.—Leeds & Northrup Co., 4901 Stenton Avenue, Philadelphia. Bulletin 120. Describes a capacity bridge for comparing an unknown capacity value with that of a self-contained standard condenser.

Lathes.—Lodge & Shipley Machine Tool Co., Cincinnati. Booklet. Describes the selective head stock, three-step cone head stock, spindle, tailstock, carriage and apron, bed and attachments in use on the company's line of lathes.

Telephone Apparatus and Equipment.—Stromberg-Carlson Telephone Mfg. Co., Rochester, N. Y. Bulletins as follows: No. 1000, mine telephones; No. 1003, construction materials and supplies; No. 1007, cordless switchboard; No. 1009, rural line equipment; No. 1010, the telephone on the farm; No. 1013, composition and hard rubber parts; No. 1014, switching telephone; No. 1015, duratex cords; No. 1016, telephone apparatus; No. 1017, inter-communicating telephone systems; No. 1018, standard telegraph code; No. 1019, exchange ringing equipment; No. 1020, battery saver attachment; No. 1021, private branch exchange switchboards; No. 1024, local battery telephones. The bulletins are illustrated.

Condensers and Auxiliaries.—C. H. Wheeler Mfg. Co., Philadelphia. Catalog, 191 pages, size 6 x 9 in. Devoted to the auxiliary equipment of a modern steam power plant. Chapters are included on the economy of high vacuum, thermodynamics of condensers, jet and barometric condensers, surface condensers, vacuum pumps, Gutermuth valves, centrifugal pumps, direct-acting steam pumps, feed water heaters, exhaust connections, water cooling towers, and marine equipment. The catalog is profusely illustrated.

Steam Turbines.—B. F. Sturtevant Co., Boston. Catalog 256. Devoted to the company's type 6 turbine, which is described as being particularly adapted for direct connection to blowers, fans, electric generators and centrifugal pumps. The construction and general principles of the turbine are described, and instructions relating to its care and operation are given. Photographs and line drawings showing parts of the turbine, to be used as reference when ordering parts, are included.

Universal Saw Benches.—Oliver Machinery Co., Grand Rapids, Mich. Pamphlet. Illustrations with a description of a universal saw bench for the pattern-making shop.

Electric Soldering Iron and Hand Tools.—Cutler-Hammer Mfg. Co., Milwaukee. Catalog. Describes electric soldering irons, an automatic soldering iron rack and a soldering fixture, all of which are illustrated.

Fans, Blowers and Exhausters.—Buffalo Forge Co., Buffalo, N. Y. Catalog 400. Specifications and descriptions with illustrations of a line of fans, blowers and exhausters. The contents include belt-driven and motor-driven pressure blowers for cupolas, forges and furnaces, mine ventilation, tunnel work, organ blowing, drying, for exhausting gases, etc. The various products are illustrated.

Lathes and Boring Mills.—Gisholt Machine Co., Madison, Wis. Catalog. Describes and illustrates an automatic turret lathe, standard turret lathes, boring mills, small tools, tool grinder, and a periodograph for time recording in factories.

Electric Cranes.—Chesapeake Iron Works, Baltimore, Md. Leaflet. Photographs of electric crane installations.

Anti-slip Treads.—American Abrasive Metals Co., 50 Church Street, New York. Pamphlet. Describes an anti-slip material made of iron with an abrasive grit embodied in the wearing surface, for use on stairs, floors, etc.

Gasolene-Electric Generating Sets.—B. F. Sturtevant Co., Hdye Park, Boston. Catalog 255. Concerned with 5, 10 and 15 kw. gasolene electric generating sets, intended for use in rural districts, on farms and isolated country estates. The sets are to be used directly on lighting and power circuits and not through a storage battery, although battery installations can be made if desired. Details and assembled views of the sets are shown.

Alloy Steels.—Carpenter Steel Co., Reading, Pa. Catalog s. Concerned with the company's output of industrial alloy steels, which includes chrome-nickel, nickel, chrome, tungsten valve, chrome-vanadium and silico-manganese steels. Case-hardening, physical properties in relation to drawing temperatures, critical point curves, hardness tests, impact tests and the pyrometer are discussed. A number of useful tables are included.

Electric Melting Pots.—Cutler-Hammer Mfg. Co., Milwaukee. Folder. Describes melting pots for lead, tin, solder, babbitt, etc.

Black Enamels and Japans.—Hilo Varnish Corporation, Marcy and Flushing avenues, Brooklyn, N. Y. Bulletin 1. Describes the company's output of air-drying enamels, baking enamels and japans. The differences in lustre are shown by a lustre chart.

Structural and Plate Worker's Tools.—Cleveland Steel Tool Co., Cleveland. Catalog 8. Line drawings with dimensions of a line of tools for structural and plate workers which the company is prepared to furnish. The tools include punches, dies, coupling nuts and punch stems, rivet sets and chisel blanks, cold chisels, miscellaneous hand tools, punch holders, etc.

Logging and Lumber Making.—General Lumber Co., Milwaukee. Booklet, 36 pages, 8 x 10½ in., with the title, "What Is Lumber?" Describes the cutting, transportation and handling of logs and the mill operations involved in converting them into lumber. The various operations are photographically shown.

Screw Driving Machines.—Reynolds Machine Co., Massillon, Ohio. Catalog F. Descriptions with illustrations of a line of machines for driving wood or machine screws.

Water Heaters.—Griscom-Russell Co., 90 West Street, New York. Bulletin 230. A general description with specifications and illustrations of Reilly feed water heaters.

Porcelain Push Sockets.—Cutler-Hammer Mfg. Co., Milwaukee. Leaflet. Illustrates and describes porcelain push sockets made in pendent type and fixture type.

Kinite Alloy Steel.—Kinite Co., Milwaukee. Folder. Describes an alloy steel known as Kinite, described as being especially adopted for making cutters, dies, taps and other tools with multiple cutting edges. This steel was described in THE IRON AGE, issue April 3, page 870.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings of "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	3.37c
Burden's H. B. & S. bar iron, base price	6.30c
Burden's best bar iron, base price	6.50c
Swedish bars, base price	20.00c
Soft Steel:	
¾ to 1⅞ in., round and square	3.37c
1 to 6 in. x ⅜ to 1 in	3.37c
1 to 6 in. x ¼ and 5/16	3.47c
Rods—⅝ and 11/16	3.42c
Bands—1½ to 6 x 3/16 to No. 8	4.07c
Shapes:	
Beams and channels—3 to 15 in	3.47c
Angles:	
3 in. x ¼ in. and larger	3.47c
3 in. x 3/16 and ⅛ in	3.72c
1½ to 2½ in. x ⅛ in	3.52c
1½ x 2¾ in. x 3/16 in. and thicker	3.47c
1 to 1¼ in. x 3/16 in	3.52c
1 to 1¼ in. x ⅛ in	3.57c
⅞ x ⅞ x ⅛ in	3.62c
¾ x ⅛ in	3.67c
⅝ x ⅛ in	4.47c
½ x 3/32 in	5.17c
Tees:	
1 x ⅛ in	3.87c
1¼ in. x 1¼ x 3/16 in	3.77c
1½ to 2½ x ¼ in	3.57c
1½ to 2½ x 3/16 in	3.57c
3 in. and larger	3.52c

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	3.37c
Toe calk, ½ x ⅜ in. and larger	4.25c
Open-hearth spring steel	6.00c
Standard cast steel, base price	14.00c
Extra cast steel	18.00 to 20.00c
Special cast steel	23.00 to 25.00c

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c

Sheets

Blue Annealed

	Per lb.
No. 8 and 3/16 in	4.52c
No. 10	4.57c
No. 12	4.62c
No. 14	4.67c
No. 16	4.77c

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	5.17c	——
Nos. 22 and 24	5.22c	6.55c
No. 26	5.27c	6.60c
No. 28	5.37c	6.75c
No. 30	5.57c	——

No. 28, 36 in. wide, 10c higher.

Wood's Keystone Hammered, 18-24 gage, 9¾c; 26-28 gage, 10¼c.

Galvanized

	Per lb.
No. 14	5.60c
No. 16	5.75c
Nos. 18 and 20	5.90c
Nos. 22 and 24	6.05c
No. 26	6.20c
No. 27	6.35c
No. 28	6.50c
No. 30	7.00c

No. 28, 36 in. wide, 20c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER	Per lb.
Bright basic	5.25c
Annealed soft	5.25c
Galvanized annealed	6.00c
Coppered basic	6.00c
Tinned soft bessemer	7.25c

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High Brass Sheet	20½c to 22¼c
High Brass Wire	20½c to 22¼c
Brass Rod	19c to 20½c
Brass Tube	31¼c to 35½c

Copper Sheets

Sheet copper, hot rolled, 16 oz., 23½c. to 26c. per lb. base.

Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20	
		Primes	Wasters
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20	80 lb.	$8.30	$8.05
		90 lb.	8.40	8.15
		100 lb.	8.55	8.30
IC .. $11.30	$10.05	IC	8.80	8.55
IX .. 13.50	12.00	IX	10.00	9.75
IXX .. 15.25	13.75	IXX	10.95	10.70
IXXX .. 17.00	15.50	IXXX	11.90	11.65
IXXXX .. 18.75	17.25	IXXXX	12.85	12.60

Terne Plates

8-Lb. Coating 14x20

100 lb.	$8.50
IC	8.65
IX	9.65
Fire door stock	11.50

Tin

Straits pig	74c to 75c
Bar	85c to 90c
American pig, 99 per cent	70c to 72c

Copper

Lake Ingot	18c to 19c
Electrolytic	17½c to 18½c
Casting	17c to 18c

Spelter and Sheet Zinc

Western spelter	8½c to 9c
Sheet zinc, No. 9 base, casks	12c; open 13c

Lead and Solder*

American pig lead	6c to 6½c
Bar lead	7½c to 8½c
Solder ½ & ½ guaranteed	45c
No. 1 solder	40c
Refined solder	34c

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb	90c
Commercial grade, per lb	50c

Antimony

Asiatic	8½c

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb. ....37c to 39c

Old Metals

The higher prices of the past few weeks are being maintained, but there is not as much activity. Dealers' buying prices are nominally as follows:

	Cents Per lb.
Copper, heavy and crucible	14.25
Copper, heavy and wire	13.25
Copper, light and bottoms	11.25
Brass, heavy	8.75
Brass, light	6.50
Heavy machine composition	13.50
No. 1 yellow rod brass turnings	7.75
No. 1 red brass or composition turnings	11.00
Lead, heavy	4.25
Lead, tea	3.50
Zinc	4.25